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<110> Ecopia BioSciences Inc  
Farnet, Chris M.  
Zazopoulos, Emmanuel

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<150> USSN 60/491,516

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Leu	Val	Gly	Ala	Pro	Gly	Gly	Ser	Ala	Arg	Leu	Arg	Glu	Asp	Gln	Trp	20	25	30	
Gln	Ala	Val	Ala	Ala	Leu	Val	Glu	Glu	Arg	Arg	Arg	Ala	Leu	Val	Val	35	40	45	
Gln	Arg	Thr	Gly	Trp	Gly	Lys	Ser	Ala	Val	Tyr	Phe	Val	Ala	Thr	Ala	50	55	60	
Leu	Leu	Arg	Arg	Arg	Gly	Ser	Gly	Pro	Thr	Val	Ile	Ile	Ser	Pro	Leu	65	70	75	80
Leu	Ala	Leu	Met	Arg	Asn	Gln	Val	Glu	Ala	Ala	Ala	Arg	Ala	Gly	Ile	85	90	95	
Gln	Ala	Arg	Thr	Ile	Asn	Ser	Ala	Asn	Pro	Glu	Glu	Trp	Glu	Thr	Ile	100	105	110	
Tyr	Gly	Glu	Val	Glu	Arg	Gly	Glu	Thr	Asp	Val	Leu	Leu	Val	Ser	Pro	115	120	125	
Glu	Arg	Leu	Asn	Ser	Val	Asp	Phe	Arg	Asp	Gln	Val	Leu	Pro	Lys	Leu	130	135	140	
Ala	Ala	Thr	Thr	Gly	Leu	Leu	Val	Val	Asp	Glu	Ala	His	Cys	Ile	Ser	145	150	155	160
Asp	Trp	Gly	His	Asp	Phe	Arg	Pro	Asp	Tyr	Arg	Arg	Leu	Arg	Thr	Met	165	170	175	
Leu	Ala	Glu	Leu	Pro	Glu	Gly	Val	Pro	Val	Leu	Ala	Thr	Thr	Ala	Thr	180	185	190	
Ala	Asn	Ala	Arg	Val	Thr	Ala	Asp	Val	Ala	Glu	Gln	Leu	Gly	Thr	His	195	200	205	
Gly	Glu	His	Ala	Leu	Val	Leu	Arg	Gly	Pro	Leu	Asp	Arg	Glu	Ser	Leu	210	215	220	
Arg	Leu	Gly	Val	Leu	Gln	Leu	Pro	Asp	Ala	Ala	His	Arg	Leu	Ala	Trp	225	230	235	240

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 Leu Thr Val Ala Ala Ala Glu Glu Val Ala Ala Phe Leu Arg Gln Arg  
 260 265 270  
 Gly Tyr Pro Val Ala Ser Tyr Thr Gly Lys Thr Glu Asn Ala Asp Arg  
 275 280 285  
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 Ala Thr Ser Ala Leu Gly Met Gly Phe Asp Lys Pro Asp Leu Gly Phe  
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 Val Val His Met Gly Ser Pro Ser Ser Pro Ile Ala Tyr Tyr Gln Gln  
 325 330 335  
 Val Gly Arg Ala Gly Arg Gly Val Asp His Ala Asp Val Leu Leu Leu  
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 Pro Gly Arg Glu Asp Glu Ala Ile Trp Ala Tyr Phe Ala Ser Val Gly  
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 Phe Pro Pro Glu Glu Gln Val Arg Arg Thr Leu Asp Val Leu Ala Gln  
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 385 390 395 400  
 Arg Arg Ser Arg Leu Glu Thr Met Leu Lys Val Leu Asp Val Asp Gly  
 405 410 415  
 Ala Val Lys Arg Val Lys Gly Gly Trp Thr Ala Thr Gly Gln Pro Trp  
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 Thr Tyr Asp Ala Glu Arg Tyr Ala Trp Val Ala Lys Gln Arg Ala Ala  
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 Glu Gln Gln Ala Met Arg Asp Tyr Val Ala Thr Thr Gly Cys Arg Met  
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 Glu Phe Leu Gln Arg Gln Leu Asp Asp Glu Lys Ala Val Pro Cys Gly  
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 Arg Cys Asp Asn Cys Ala Gly Ser Trp Leu Glu Ala Val Val Ser Pro  
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 Ala Ala Leu Ala Ala Ala Ala Gly Glu Leu Asp Arg Ala Gly Val Glu  
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 Val Glu Ser Arg Lys Met Trp Pro Thr Gly Leu Ala Ala Val Gly Met  
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 Asp Leu Lys Gly Arg Ile Pro Ala Gly Gln Gln Ala Val Thr Gly Arg  
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 Ala Leu Gly Arg Leu Ser Asp Ile Gly Trp Gly Asn Arg Leu Arg Pro  
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 Ala Ala Val Val Thr Val Leu Ala Asp Trp Ala Arg Ser Pro Gly Gly  
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 Trp Ala Ser Gly Gly Pro Asp Ala Met Ala Arg Pro Val Gly Ile Val  
 595 600 605  
 Ala Met Pro Ser Arg Thr Arg Pro Arg Leu Val Ala Ser Leu Ala Glu  
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 625 630 635 640  
 Thr Pro Gln Ala Asp Val Tyr Gly Ala His Arg Ser Asn Ser Ala Gln  
 645 650 655  
 Arg Leu Arg Ala Leu Ala Asp Ser Phe Thr Val Pro Glu Glu Leu Ala  
 660 665 670  
 Ala Ala Leu Ala Ala Ala Pro Gly Pro Val Leu Leu Val Asp Asp Tyr  
 675 680 685  
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<211> 2160

<212> DNA

<213> Streptomyces aizunensis

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gagcgccggc gggccctggt ggtgcagcgc acgggctggg gcaagtccgc ggtctacttc	180
gtcgccaccg ctctgctgcg ccggcgcggt tccgggccga cggatgatcat ttctccgctg	240
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<212> PRT

<213> *Streptomyces aizunensis*

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Gly	Ile	Val	Asp	Ile	Gly	Ala	Tyr	Ala	Asp	Ala	Leu	Thr	Glu	Gln	Leu
65					70					75					80
Val	Pro	Trp	Leu	Asp	Arg	Pro	Leu	Ala	Phe	Phe	Gly	His	Ser	Met	Gly
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Ala	Ile	Leu	Ala	Phe	Glu	Val	Thr	Arg	Arg	Leu	Glu	Arg	Asp	His	Gly
			100					105					110		
Val	Thr	Pro	Glu	His	Ile	Phe	Ala	Ser	Gly	Arg	Arg	Ser	Pro	Ala	Ser
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	130					135					140				
Glu	Met	Arg	Glu	Leu	Ser	Gly	Thr	Asp	Ala	Lys	Ile	Leu	Gly	Asn	Glu
145					150					155					160
Glu	Ile	Leu	Arg	Met	Val	Leu	Pro	Ala	Ile	Arg	Ser	Asp	Tyr	Thr	Ala
				165					170					175	
Ile	Glu	Asn	Tyr	Arg	Ala	Ala	Pro	Glu	Asp	Val	Val	Arg	Thr	Pro	Ile
			180					185					190		
Thr	Val	Leu	Thr	Gly	Asp	Ala	Asp	Pro	Arg	Thr	Ser	Arg	Glu	Glu	Ala
		195					200					205			
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	210					215					220				
Pro	Gly	Gly	His	Phe	Phe	Leu	Ala	Asn	His	Gln	Glu	Lys	Ile	Met	Gly
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<212> DNA

<213> Streptomyces aizunensis

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cagtcgctgg ctccggcgat ggacgtcctc tcggtccagt accccggcag gcaggaccgc	180
agggacgagc ccgggatcgt ggacatcggc gcctacgcgg acgccctgac cgagcaactc	240
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<400> 6

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 35 40 45  
 Glu Glu Ala Ile Ser Ala Gly Ala Leu Val Leu Glu Ala Thr Gly Ser  
 50 55 60  
 Arg Ala Glu Arg Tyr Leu Pro Phe Gly Ile Leu Arg Arg Ile Leu Asp  
 65 70 75 80  
 Ser Ala Ala Pro Leu Ser Pro Glu Ile His Ala Tyr Ala Thr Glu Leu  
 85 90 95  
 Leu Asp Arg Val Ser Ala Gly Thr Thr Asp Ala Glu Gly Ala Val Glu  
 100 105 110  
 Ala Gly Met Arg Val Leu Pro His Val Ala Thr Ala Leu Leu Arg Ile  
 115 120 125  
 Ala Arg Asn Arg Thr Val Val Ile Ala Ile Asp Asp Val His His Gly  
 130 135 140  
 Asp Glu Leu Ser Leu Ala Phe Leu Leu Cys Leu Ala Arg Arg Val Arg  
 145 150 155 160  
 Gln Ala Gly Val Leu Ile Val Leu Thr Glu Ala Val Arg Leu Arg Ser  
 165 170 175  
 Ala Gln Leu Ala Phe His Ala Glu Leu Gln Arg Gln Pro Asn Cys Thr  
 180 185 190

Ser Leu Arg Leu Pro Leu Leu Thr Thr Arg Gly Thr Thr Arg Val Leu  
 195 200 205  
 Ala Glu His Phe Ser Pro Ser Thr Ala Gln Arg Leu Ser Ala Glu Cys  
 210 215 220  
 Gln Glu Thr Thr Gly Gly Asn Pro Leu Leu Val Arg Ala Leu Ile Asp  
 225 230 235 240  
 Asp Gly Leu Thr Ala Leu Gly Asp Ser Glu Pro Phe Gln Arg Leu Ala  
 245 250 255  
 Pro Ala Glu Thr Phe Glu Arg Ala Val Leu Asp Cys Leu His Arg Gly  
 260 265 270  
 Asp Pro Glu Leu Leu Thr Val Ala Arg Gly Val Ala Val Leu Gly Ser  
 275 280 285  
 Ala Cys Ser Leu Ala Leu Leu Asn Gly Ile Val Asp Leu His Ala Lys  
 290 295 300  
 Ala Thr Glu Gln Ala Leu Gln Asp Leu Ser Arg Cys Ala Val Leu His  
 305 310 315 320  
 His Gly Ser Phe Arg Asp Pro Ala Ala Arg Thr Ala Val Leu Glu Ala  
 325 330 335  
 Thr Pro Pro Ala Ala Leu Ser Ala Leu His Leu Arg Thr Ala Arg Leu  
 340 345 350  
 Leu His Gln Glu Gly Ala Thr Ala Leu Asp Val Ala Arg His Leu Leu  
 355 360 365  
 Ala Ala Arg Lys Asn Val Glu Asp Trp Ala Ile Pro Val Leu Gln Glu  
 370 375 380  
 Ala Val Glu Tyr Ala Leu Val Glu Asp Glu His Glu Leu Ala Leu Arg  
 385 390 395 400  
 Cys Gly Glu Leu Ala Val Ala Ser Cys Ala Glu Gly Pro Arg His Ala  
 405 410 415  
 Ala Leu Lys Ser Arg Leu Ala Ser Ile Val Trp Arg Ser Ser Pro Ala  
 420 425 430  
 Ala Ala Glu Gly His Leu Arg Gln Leu Ser Arg Glu Leu Ala Ala Gly  
 435 440 445  
 Arg Leu Ala Asp Arg Asp Leu Val Gln Ala Val Ser Leu Leu Ala Trp  
 450 455 460  
 Met Gly Glu Ser Arg Gly Ala Gly Glu Ala Val Leu Arg Leu Gln Arg  
 465 470 475 480  
 Thr Asp Ser Glu Ala Glu Ala Ala Gly Arg Ala Pro Ala Tyr Asp Pro  
 485 490 495  
 Gly Thr Leu Thr Ala Ala Gln Ser Trp Leu Ser Met Val Ser Pro Pro  
 500 505 510

Ala	Arg	Asp	Leu	Phe	Asp	Ala	Val	Glu	Pro	Arg	Arg	Thr	Thr	Leu	Ser	515	520	525
Gly	Ala	Pro	Gly	Ala	Leu	Pro	Gly	Ala	Gly	Pro	Asp	Thr	Val	Pro	Tyr	530	535	540
Asp	Met	Pro	Asp	Asn	Ala	Tyr	Val	Gln	Ala	Ala	Asp	Ala	Val	Arg	Thr	545	550	555
Ala	Leu	Arg	Gly	Gly	Thr	Gln	Ala	Asp	Ala	Ala	Val	Ser	Lys	Ala	Thr	565	570	575
Arg	Val	Leu	Gln	Arg	Tyr	His	Leu	Ser	Asp	Arg	Thr	Leu	Gln	Pro	Leu	580	585	590
Val	Phe	Ala	Leu	Leu	Ala	Val	Ile	Tyr	Ala	Gly	Arg	Leu	Asp	Leu	Ala	595	600	605
Ser	Ala	Trp	Cys	Glu	Arg	Leu	Leu	Gly	Glu	Cys	Ser	Ala	Arg	Asn	Ala	610	615	620
Pro	Thr	Trp	Gln	Ala	Ala	Leu	Gly	Val	Val	Arg	Ala	Glu	Ile	Leu	Leu	625	630	635
Arg	Gln	Gly	Asp	Leu	Pro	Gly	Ala	Ala	Ala	Gln	Ala	Arg	His	Ala	Met	645	650	655
Ser	Arg	Ile	Ser	Leu	Gln	Ser	Trp	Gly	Val	Gly	Ile	Ala	Leu	Pro	Leu	660	665	670
Ala	Val	Leu	Val	Glu	Ala	Glu	Val	Gln	Met	Gly	Asp	His	Glu	Glu	Ala	675	680	685
Met	Ser	Leu	Leu	Glu	Gln	Pro	Val	Pro	Gln	Ala	Met	Phe	Asp	Thr	Leu	690	695	700
Ala	Gly	Leu	His	Tyr	Leu	Arg	Ala	Arg	Gly	Arg	Cys	His	Leu	Ala	Thr	705	710	715
Gly	Arg	Tyr	His	Ala	Ala	Val	Arg	Asp	Phe	Leu	Asn	Cys	Gly	Glu	Leu	725	730	735
Met	Gln	Ala	Trp	Gly	Val	Asp	Gly	Ala	Glu	Leu	Val	Pro	Trp	Arg	Leu	740	745	750
Asp	Ala	Ala	Glu	Ala	Trp	Leu	Ala	Leu	Gly	Asn	Val	Ala	Arg	Ala	Lys	755	760	765
Glu	Tyr	Thr	Glu	Gln	Gln	Lys	Gln	Arg	Glu	Thr	Gly	Pro	Val	Gly	Ser	770	775	780
Arg	Thr	Arg	Gly	Ser	Leu	Leu	Leu	Thr	Leu	Ala	His	Thr	Gly	Gly	Asp	785	790	795
Leu	Thr	Val	Arg	Leu	Lys	Arg	Leu	Val	Glu	Ala	Val	Glu	Thr	Leu	Glu	805	810	815
Glu	Gly	Gly	Asp	Arg	Leu	Gln	Leu	Ala	Val	Ala	Leu	Gly	Glu	Leu	Gly	820	825	830

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 Arg Lys Ala Trp His Val Ala Lys Ser Cys Gly Ala Glu Pro Leu Cys  
 850 855 860  
 Gln Gln Phe Met Pro Gly Gln Val Asp Gly Glu Ala Gly Ala Gln Ser  
 865 870 875 880  
 Gly Arg Glu Ala Glu Leu Pro Ser Glu Val Glu Val Leu Ser Glu Ala  
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 Glu Ala Arg Val Ala Leu Leu Ala Ala Arg Gly His Thr Asn Arg Glu  
 900 905 910  
 Ile Ala Thr Lys Leu Tyr Val Thr Val Ser Thr Val Glu Gln His Leu  
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<211> 201  
<212> PRT  
<213> Streptomyces aizunensis  
<400> 8

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			20					25					30		
Glu	Glu	Ala	Ile	Ala	Met	Val	Thr	Arg	Leu	Ala	Pro	Asp	Ile	Val	Leu
		35					40					45			
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Glu	Ser	Asp	Thr	Asp	Ile	Leu	Arg	Ala	Val	Glu	Ala	Gly	Ala	Ala	Gly
				85					90					95	
Tyr	Leu	Leu	Lys	Gly	Ser	Ser	Arg	Asp	Glu	Leu	Val	Gln	Ala	Val	Lys
			100					105					110		
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Arg	Glu	Val	Leu	Gln	Leu	Val	Ser	Leu	Gly	Leu	Thr	Asn	Ala	Asp	Ile
145					150					155					160
Gly	Arg	Gln	Leu	Phe	Ile	Ser	Glu	Ala	Thr	Val	Lys	Thr	His	Leu	Leu
			165						170					175	
Arg	Ser	Phe	Lys	Lys	Leu	Ser	Val	Ser	Asp	Arg	Thr	Ala	Ala	Val	Ile
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<211> 606  
<212> DNA  
<213> Streptomyces aizunensis

<400> 9  
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<210> 10  
<211> 416  
<212> PRT  
<213> Streptomyces aizunensis

<400> 10

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35 40 45  
Glu Gln Val His Arg Ala Val Ala Met Ala Ala Leu Thr Ala Ala Val  
50 55 60  
Pro Trp Tyr Ala Ala Leu Gly Arg Ser Thr Met Val His Glu Gly Gln  
65 70 75 80  
Gly Pro Val Arg Arg Ser Val Val Phe Ser Val Gly Leu Phe Val Leu  
85 90 95  
Phe Ala Val Ala Val Val Phe Asp Leu Ala Ala Ser Phe Ala Leu Phe  
100 105 110  
Ala Val Val Pro Met Leu Met Met Ser Leu Ala Thr Ser Pro Ala Ile  
115 120 125  
Ala Val Val Thr Leu Ala Asn Leu Val Pro Val Ile Val Val Trp Leu  
130 135 140  
Arg Gly Gly Thr Leu Ser Arg Asp Ile Leu Ala Val Leu Pro Thr Ser  
145 150 155 160  
Leu Leu Gly Ile Ala Leu Ser Val Met Leu Gly Leu Trp Ile Thr Arg





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<210> 12
<211> 186
<212> PRT
<213> Streptomyces aizunensis

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<400> 12

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20          25          30
Met Leu Pro Ser Leu Leu Ala Val Val Val Ile Leu Ala Leu Leu Val
35          40          45
His Thr Leu Pro Leu Asp Gly Asn Asp Pro Ser Leu Gln Leu Ala Gly
50          55          60
Ile Gly Ala Gly Ile Ile Cys Gly Leu Ala Ala Thr Ala Leu Leu Pro
65          70          75          80
Ala His Arg Asn Ala Ser Gly Glu Val Ser Thr Lys Gly Gly Ile Gly
85          90          95

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 Asp Tyr Lys Leu Ser Gly Gln Ala Val Tyr Ser Asn Ala Phe Ala Phe  
 130 135 140  
 Met Ala Leu Ala Met Val Leu Thr Arg Thr Ala Val Leu Leu Asn Thr  
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 <211> 561  
 <212> DNA  
 <213> Streptomyces aizunensis

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 <211> 163  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 14

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35	40	45
Phe Phe Gly Trp Ala Phe Leu Ile Ser Leu Val Pro Gly Leu Ala Tyr		
50	55	60
Met Ala Val Met Pro Ala Trp Arg Tyr Arg Val His Arg Trp Glu Thr		
65	70	75
Thr Asp Glu Ala Val Tyr Ala Ala Ser Gly Trp Leu Trp Gln Gln Trp		
	85	90
Arg Val Val Pro Met Ser Arg Ile Gln Thr Val Asp Thr Leu Arg Gly		
	100	105
Pro Leu Gln Gln Leu Phe Gly Leu Ser Gly Ile Thr Val Thr Thr Ala		
	115	120
Ser Tyr Ser Gly Ala Val Lys Ile Lys Gly Ile Asp His Arg Thr Ala		
	130	135
Arg Asp Val Val Glu His Leu Thr Arg Val Thr Gln Ala Thr Pro Gly		
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		160
Asp Ala Thr		

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 <211> 492  
 <212> DNA  
 <213> Streptomyces aizunensis

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 <211> 514  
 <212> PRT  
 <213> Streptomyces aizunensis

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 35 40 45  
 Val Ala Leu Thr Gly Ala Asn Leu Gln Ala Leu Ile Ser Leu Gly Ser  
 50 55 60  
 Leu Leu Ile Val Phe Leu Val Ile Thr Gly Ile Ser Thr Met Arg Leu  
 65 70 75 80  
 Leu Thr Thr Arg Phe Arg Val Thr Ala Glu Arg Val Glu Leu Arg Ser  
 85 90 95  
 Gly Leu Leu Phe Arg Ser Arg Arg Ser Val Pro Ile Asp Arg Val Arg  
 100 105 110  
 Ser Val Asp Val Glu Ala Lys Pro Val His Arg Leu Phe Gly Leu Ala  
 115 120 125  
 Ser Leu Arg Ile Gly Thr Gly Glu Gln Gly Ala Ser Ser Arg Arg Leu  
 130 135 140  
 Ser Leu Asp Gly Ile Thr Arg Arg Gln Ala Arg Arg Leu Arg Arg Leu  
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 Leu Ile Asp Arg Arg Gly Ser Gly His Ala Thr Gly Gln Asp Gln Asp  
 165 170 175  
 Val Thr Ile Ala Glu Met Asp Trp Ala Trp Leu Arg Tyr Ala Pro Leu  
 180 185 190  
 Thr Ile Trp Gly Val Gly Ser Val Phe Ala Ala Val Gly Thr Ala Tyr  
 195 200 205  
 Arg Ile Leu His Glu Met Lys Val Asp Pro Leu Glu Leu Gly Val Val  
 210 215 220  
 Lys Asp Ile Glu Asp Arg Phe Gly Ser Val Pro Leu Trp Phe Gly Ile  
 225 230 235 240  
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 245 250 255  
 Ala Thr Phe Val Asp Ala Trp Thr Asn Tyr Arg Leu Glu Arg Glu Gly  
 260 265 270  
 Val Gly Ile Phe Arg Ile Arg Arg Gly Leu Leu Ile Ser Arg Ser Val  
 275 280 285  
 Thr Ile Glu Glu Arg Arg Leu Arg Gly Val Glu Leu Ala Glu Pro Met  
 290 295 300  
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 305 310 315 320  
 Leu Ser Asn Ser Gln Glu Asn Arg Ser Arg Cys Ser Leu Thr Pro Pro  
 325 330 335

Val Pro Arg Asp Glu Ala Leu Arg Val Ala Ala Asp Val Leu Ala Glu  
 340 345 350  
 Glu Gly Ser Pro Thr Glu Leu Thr Lys Leu Val Arg His Ser Arg Ala  
 355 360 365  
 Ala Leu Arg Arg Arg Ile Asn Arg Gly Leu Leu Val Leu Ala Ala Val  
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 385 390 395 400  
 His Thr Ala Trp Ile Thr Ala Leu Val Gly Leu Pro Val Val Ile Val  
 405 410 415  
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 420 425 430  
 Tyr Leu Val Val Arg Ala Gly Thr Phe Ala Arg Arg Thr Val Ala Val  
 435 440 445  
 Gln Arg Asp Gly Val Ile Gly Trp Asn Ile Ser Arg Ser Tyr Phe Gln  
 450 455 460  
 Arg Arg Ser Gly Leu Leu Thr Ile Gly Ala Thr Thr Ala Gly Val Gly  
 465 470 475 480  
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Arg Gly

<210> 17  
 <211> 1545  
 <212> DNA  
 <213> *Streptomyces aizunensis*

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 <211> 164051  
 <212> DNA  
 <213> *Streptomyces aizunensis*

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Asp	Ala	Ala	Val	His	His	Gly	Gly	Ala	Gly	Thr	Thr	Leu	Ala	Ala	Leu	275	280	285	
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 610 615 620  
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Val	Ala	His	Ala	His	Val	Arg	Gly	Ala	Glu	Thr	Asp	Trp	Ala	Ala	Phe	995	1000	1005
Phe	Ala	Gly	Thr	Gly	Ala	Gln	Arg	Val	Asp	Leu	Pro	Thr	Tyr	Ala		1010	1015	1020
Phe	Gln	Arg	Gln	Arg	Tyr	Trp	Met	Asp	Ser	Arg	Thr	Pro	Ala	Pro		1025	1030	1035
Asp	Ser	Ala	Ala	Gln	Arg	Ala	His	Gly	Gly	Ala	Asp	Pro	Val	Asp		1040	1045	1050
Arg	Val	Phe	Trp	Asp	Ala	Val	Glu	His	Glu	Asp	Val	Ala	Thr	Leu		1055	1060	1065
Ala	Ala	Ala	Leu	Glu	Leu	Asp	Leu	Asp	Gly	Glu	Gln	Pro	Leu	Ser		1070	1075	1080
Glu	Val	Val	Pro	Ala	Leu	Ser	Ala	Trp	Arg	Arg	Arg	Arg	Arg	Thr		1085	1090	1095
Gln	Ser	Glu	Val	Asp	Gly	Trp	Arg	Tyr	Arg	Val	Thr	Trp	Lys	Pro		1100	1105	1110
Leu	Thr	Glu	Val	Ser	Thr	Ser	Gly	Leu	Ser	Gly	Ser	Trp	Val	Val		1115	1120	1125
Ile	Ser	Pro	Ala	Gly	Gly	Ala	Asp	Asp	Ser	Ala	Val	Val	Ser	Ala		1130	1135	1140
Leu	Val	Gly	Arg	Gly	Val	Asp	Val	Arg	Arg	Val	Val	Val	Glu	Ala		1145	1150	1155
Gly	Val	Asp	Arg	Ser	Ala	Leu	Ala	Gly	Leu	Leu	Ala	Glu	Val	Gly		1160	1165	1170
Ser	Pro	Ser	Gly	Val	Val	Ser	Leu	Leu	Gly	Leu	Asp	Glu	Ser	Gly		1175	1180	1185
Gly	Leu	Leu	Gly	Thr	Val	Gly	Leu	Val	Gln	Ala	Leu	Gly	Asp	Ala		1190	1195	1200
Gly	Val	Gly	Ala	Pro	Leu	Trp	Cys	Leu	Thr	Arg	Gly	Ala	Val	Ser		1205	1210	1215
Val	Gly	Arg	Ser	Asp	Arg	Leu	Val	Ser	Pro	Val	Gln	Ala	Gln	Val		1220	1225	1230
Trp	Gly	Leu	Gly	Arg	Val	Ala	Ala	Leu	Glu	Val	Pro	Glu	Trp	Trp		1235	1240	1245
Gly	Gly	Leu	Ile	Asp	Leu	Pro	Glu	Val	Leu	Asp	Glu	Arg	Ala	Val		1250	1255	1260

Ser	Arg	Leu	Val	Gly	Val	Leu	Ala	Gly	Ser	Gly	Glu	Asp	Gln	Val	
1265						1270					1275				
Ala	Val	Arg	Ser	Ser	Gly	Val	Phe	Gly	Arg	Arg	Leu	Val	Arg	Ala	
1280						1285					1290				
Pro	Arg	Ala	Glu	Gly	Ala	Ser	Ala	Trp	Ser	Pro	Thr	Gly	Thr	Val	
1295						1300					1305				
Leu	Val	Thr	Gly	Gly	Thr	Gly	Val	Leu	Gly	Gly	Arg	Val	Ala	Arg	
1310						1315					1320				
Trp	Leu	Ala	Gly	Ala	Gly	Ala	Glu	Arg	Leu	Val	Leu	Thr	Ser	Arg	
1325						1330					1335				
Arg	Gly	Leu	Asp	Ala	Pro	Gly	Ala	Val	Glu	Leu	Val	Glu	Glu	Leu	
1340						1345					1350				
Thr	Thr	Gly	Phe	Gly	Val	Glu	Val	Ser	Val	Val	Ala	Cys	Asp	Ala	
1355						1360					1365				
Ala	Asp	Arg	Asp	Ala	Leu	Arg	Ala	Leu	Leu	Ser	Ala	Glu	Ala	Gly	
1370						1375					1380				
Ser	Leu	Thr	Ala	Val	Val	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	
1385						1390					1395				
Val	Leu	Asp	Ala	Leu	Thr	Pro	Asp	Arg	Ile	Asp	Ser	Val	Val	Arg	
1400						1405					1410				
Ala	Lys	Ala	Val	Ser	Ala	Leu	Asn	Leu	His	Glu	Leu	Thr	Ala	Glu	
1415						1420					1425				
Leu	Gly	Ile	Glu	Leu	Ser	Asp	Phe	Val	Leu	Phe	Ser	Ser	Val	Thr	
1430						1435					1440				
Gly	Thr	Val	Gly	Ala	Ala	Gly	Gln	Ala	Asn	Tyr	Ala	Ala	Ala	Asn	
1445						1450					1455				
Ala	Phe	Leu	Asp	Ala	Leu	Ala	Glu	Gln	Arg	Arg	Ala	Asp	Gly	Leu	
1460						1465					1470				
Ala	Ala	Thr	Ser	Ile	Ala	Trp	Gly	Pro	Trp	Ala	Glu	Gly	Gly	Met	
1475						1480					1485				
Ala	Ala	Asp	Glu	Ala	Met	Asp	Ala	Arg	Met	Arg	Arg	Glu	Gly	Met	
1490						1495					1500				
Pro	Pro	Met	Ala	Pro	Thr	Ser	Ala	Met	Ser	Ala	Leu	Glu	Gln	Ala	
1505						1510					1515				
Val	Gly	Ala	Gly	Glu	Thr	Ala	Leu	Thr	Val	Ala	Asp	Ile	Asp	Trp	
1520						1525					1530				
Glu	Arg	Phe	Ser	Ser	Val	Ile	Ala	Ala	Val	Arg	Pro	Asn	Pro	Leu	
1535						1540					1545				
Ile	Gly	Asp	Phe	Val	Val	Gly	Ala	Glu	Gly	Thr	Ala	Ala	Ala	Ser	
1550						1555					1560				



Gly	His	Gly	Ser	Val	Val	Thr	Gly	Ala	Asp	Val	Ala	Ala	Thr	Val
1565						1570					1575			
Ser	Gly	Arg	Leu	Ala	Gly	Leu	Thr	Gln	Ala	Glu	Gln	Glu	Arg	Glu
1580						1585					1590			
Leu	Leu	Ser	Leu	Val	Arg	Leu	His	Val	Ala	Ala	Val	Leu	Gly	His
1595						1600					1605			
Asp	Gly	Ser	Asp	Ala	Val	Gly	Ala	Glu	Arg	Ala	Phe	Lys	Glu	Leu
1610						1615					1620			
Gly	Phe	Asp	Ser	Leu	Thr	Ser	Val	Glu	Leu	Arg	Asn	Arg	Leu	Gly
1625						1630					1635			
Ala	Ala	Thr	Asp	Leu	Arg	Leu	Pro	Thr	Thr	Leu	Val	Tyr	Asp	Tyr
1640						1645					1650			
Pro	Thr	Ser	Ala	Ala	Leu	Ala	Glu	Tyr	Leu	Arg	Gly	Glu	Leu	Ala
1655						1660					1665			
Gly	Ser	Ala	Gln	Asp	Ala	Gly	Pro	Pro	Leu	Pro	Ala	Val	Val	Gly
1670						1675					1680			
Ser	Ala	Ala	Asp	Asp	Asp	Pro	Ile	Val	Ile	Val	Ser	Met	Ser	Cys
1685						1690					1695			
Arg	Phe	Pro	Gly	Gly	Val	Arg	Thr	Pro	Glu	Asp	Leu	Trp	Gln	Leu
1700						1705					1710			
Leu	Ala	Asp	Gly	Thr	Asp	Thr	Val	Ala	Ala	Phe	Pro	Ala	Asp	Arg
1715						1720					1725			
Gly	Trp	Asp	Leu	Asp	Gly	Leu	Tyr	Ser	Ala	Asp	Pro	Glu	Arg	Ser
1730						1735					1740			
Gly	Thr	Ser	Tyr	Thr	Arg	Glu	Gly	Gly	Phe	Leu	Tyr	Asp	Ala	Ala
1745						1750					1755			
Asp	Phe	Asp	Ala	Asp	Phe	Phe	Gly	Ile	Ser	Pro	Arg	Glu	Ala	Leu
1760						1765					1770			
Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Leu	Leu	Glu	Thr	Ala	Trp	Glu
1775						1780					1785			
Thr	Phe	Glu	Arg	Ala	Gly	Ile	Asp	Pro	Ala	Ser	Leu	Arg	Gly	Ser
1790						1795					1800			
Gln	Ala	Gly	Val	Phe	Val	Gly	Thr	Asn	Gly	Gln	Asp	Tyr	Leu	Ser
1805						1810					1815			
Leu	Val	Thr	Arg	Glu	Gly	Asp	Gly	Leu	Asp	Gly	Leu	Glu	Gly	His
1820						1825					1830			
Val	Gly	Thr	Gly	Asn	Ala	Ala	Ser	Val	Val	Ser	Gly	Arg	Leu	Ser
1835						1840					1845			
Tyr	Val	Phe	Gly	Leu	Glu	Gly	Pro	Ala	Ile	Thr	Val	Asp	Thr	Ala
1850						1855					1860			

Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala	Val	Gln	Ala	Leu
1865						1870					1875			
Arg	Gln	Gly	Glu	Cys	Thr	Leu	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val
1880						1885					1890			
Met	Ser	Thr	Pro	Asp	Ala	Phe	Val	Asp	Phe	Ser	Arg	Gln	Arg	Gly
1895						1900					1905			
Leu	Ala	Glu	Asp	Gly	Arg	Ile	Lys	Ala	Phe	Ala	Ser	Ala	Ala	Asp
1910						1915					1920			
Gly	Thr	Gly	Trp	Gly	Glu	Gly	Val	Gly	Met	Leu	Leu	Val	Glu	Arg
1925						1930					1935			
Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly	His	Pro	Val	Leu	Ala	Val	Val
1940						1945					1950			
Arg	Gly	Ser	Ala	Ile	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr
1955						1960					1965			
Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val	Ile	Arg	Gln	Ala	Leu
1970						1975					1980			
Ala	Gly	Ala	Gly	Leu	Ser	Ala	Ala	Asp	Val	Asp	Ala	Val	Glu	Ala
1985						1990					1995			
His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gln	Ala
2000						2005					2010			
Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Gly	Arg	Pro	Ala	Asp	Arg	Pro	Leu
2015						2020					2025			
Trp	Leu	Gly	Ser	Val	Lys	Ser	Asn	Ile	Gly	His	Thr	Gln	Ala	Ala
2030						2035					2040			
Ala	Gly	Val	Ala	Gly	Val	Met	Lys	Met	Val	Met	Ala	Met	Arg	His
2045						2050					2055			
Gly	Val	Leu	Pro	Arg	Thr	Leu	His	Val	Asp	Gly	Pro	Thr	Pro	His
2060						2065					2070			
Val	Asp	Trp	Ser	Ala	Gly	Asp	Val	Ala	Leu	Leu	Thr	Glu	Gln	Arg
2075						2080					2085			
Glu	Trp	Pro	Ala	Thr	Gly	His	Pro	Arg	Arg	Ala	Gly	Val	Ser	Ser
2090						2095					2100			
Phe	Gly	Leu	Ser	Gly	Thr	Asn	Ala	His	Thr	Ile	Ile	Glu	Glu	Ala
2105						2110					2115			
Pro	Ala	Asp	Asp	Asp	Ala	Glu	Pro	Thr	Thr	Gly	Ala	Gly	Thr	Ala
2120						2125					2130			
Pro	Ser	Val	Leu	Pro	Leu	Leu	Ile	Ser	Ala	Lys	Ser	Asp	Ala	Gly
2135						2140					2145			
Leu	Arg	Ala	Gln	Ser	Glu	Gln	Leu	Ala	Thr	His	Leu	Val	Gly	Asn
2150						2155					2160			

Pro	Asp	Val	Pro	Ile	Gly	Asp	Ile	Ala	Tyr	Ser	Leu	Thr	Thr	Gly
2165						2170					2175			
Arg	Ser	Gly	Leu	Glu	Thr	Arg	Ala	Ile	Leu	Val	Gly	Asp	Ala	Asp
2180						2185					2190			
Asn	Arg	Thr	Gly	Leu	Ala	Ala	Ala	Leu	Arg	Ser	Leu	Ala	Ala	Gly
2195						2200					2205			
Glu	Gln	Ala	Pro	Gly	Leu	Val	Gln	Gly	Thr	Val	Thr	Glu	Gly	Gly
2210						2215					2220			
Leu	Ala	Phe	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met
2225						2230					2235			
Gly	Arg	Glu	Leu	Tyr	Glu	Thr	Tyr	Pro	Val	Phe	Ala	Asp	Ala	Leu
2240						2245					2250			
Asp	Ala	Val	Cys	Ala	Arg	Met	Asp	Leu	Glu	Val	Pro	Leu	Arg	Asp
2255						2260					2265			
Val	Leu	Phe	Gly	Ala	Tyr	Ala	Gly	Leu	Leu	Asp	Glu	Thr	Ala	Tyr
2270						2275					2280			
Thr	Gln	Pro	Ala	Leu	Phe	Ala	Val	Glu	Val	Ala	Leu	Phe	Arg	Leu
2285						2290					2295			
Val	Glu	Ser	Trp	Gly	Leu	Arg	Pro	Asp	Phe	Val	Ala	Gly	His	Ser
2300						2305					2310			
Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Leu	Ser	Leu
2315						2320					2325			
Asp	Asp	Ala	Cys	Ala	Leu	Val	Glu	Ala	Arg	Gly	Arg	Leu	Met	Gly
2330						2335					2340			
Ala	Leu	Pro	Gly	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala	Pro	Glu
2345						2350					2355			
Ala	Glu	Val	Leu	Pro	Leu	Leu	Thr	Glu	Arg	Val	Ser	Ile	Ala	Ala
2360						2365					2370			
Ile	Asn	Gly	Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu	Ala	Asp
2375						2380					2385			
Ala	Val	Ala	Ile	Val	Glu	Ser	Phe	Thr	Gly	Arg	Lys	Ser	Lys	Arg
2390						2395					2400			
Leu	Thr	Val	Ser	His	Ala	Phe	His	Ser	Pro	His	Met	Asp	Gly	Met
2405						2410					2415			
Leu	Glu	Asp	Phe	Arg	Ala	Val	Ala	Glu	Gly	Leu	Ser	Tyr	Glu	Ala
2420						2425					2430			
Pro	Arg	Ile	Pro	Val	Val	Ser	Asn	Leu	Thr	Gly	Ala	Leu	Val	Ser
2435						2440					2445			
Asp	Glu	Met	Gly	Ser	Ala	Glu	Phe	Trp	Val	Arg	His	Val	Arg	Glu
2450						2455					2460			

Ala Val	Arg Phe Leu Asp	Gly Met Arg Val Leu	Glu Ala Ala Gly
2465		2470	2475
Val Thr	Thr Tyr Val Glu	Leu Gly Pro Gly Gly	Val Leu Ser Ala
2480		2485	2490
Leu Ala	Gln Glu Cys Val	Ser Gly Asp Gly Ala	Ala Phe Val Pro
2495		2500	2505
Val Leu	Arg Ser Gly Arg	Pro Glu Ala Glu Thr	Ala Val Thr Ala
2510		2515	2520
Leu Ala	Gln Ala His Val	Arg Gly Val Asp Val	Asp Trp Ala Ala
2525		2530	2535
Phe Phe	Ser Gly Thr Gly	Val Gln Arg Val Asp	Leu Pro Thr Tyr
2540		2545	2550
Ala Phe	Gln Arg Gln Arg	Phe Trp Pro Ala Met	Thr Ala Glu Ser
2555		2560	2565
Ala Pro	Val Gly Gly Thr	Val Asp Ala Val Asp	Ala His Phe Trp
2570		2575	2580
Asp Val	Ile Glu Gln Glu	Asp Val Glu Ser Leu	Ala Glu Leu Leu
2585		2590	2595
Gly Leu	Asp Asp Ala Ser	Ala Trp Gly Ser Val	Val Pro Ala Leu
2600		2605	2610
Ser Ala	Trp Arg Arg Gln	Gly Gln Gln Gln Ala	Gln Val Asp Gly
2615		2620	2625
Trp Arg	Tyr Arg Ala Ser	Trp Lys Pro Val Thr	Ala Ala Val Ser
2630		2635	2640
Ser Gly	Val Val Ser Gly	Thr Trp Val Val Ala	Val Pro Ala Gly
2645		2650	2655
Ser Ala	Gly Asp Asp Ala	Arg Val Glu Ala Val	Thr Asn Gly Leu
2660		2665	2670
Ala Gly	Arg Gly Val Asp	Val Arg Arg Val Val	Val Glu Ala Gly
2675		2680	2685
Val Asp	Arg Ala Ala Leu	Ala Gly Leu Leu Ala	Gly Glu Gly Ser
2690		2695	2700
Leu Ala	Gly Val Val Ser	Leu Leu Gly Leu Asp	Glu Ser Gly Gly
2705		2710	2715
Leu Ala	Ala Thr Ala Gly	Leu Val Gln Ala Leu	Gly Asp Ala Gly
2720		2725	2730
Val Ser	Ala Pro Leu Trp	Cys Leu Thr Arg Gly	Ala Val Ser Val
2735		2740	2745
Gly Arg	Ser Asp Arg Leu	Val Ser Pro Val Gln	Ala Gln Val Trp
2750		2755	2760

Gly	Leu	Gly	Arg	Val	Ala	Ala	Leu	Glu	Val	Pro	Glu	Arg	Trp	Gly
2765						2770					2775			
Gly	Leu	Val	Asp	Leu	Pro	Glu	Val	Leu	Asp	Glu	Arg	Ala	Val	Ser
2780						2785					2790			
Arg	Leu	Ile	Gly	Val	Leu	Ala	Gly	Ser	Gly	Glu	Asp	Gln	Val	Ala
2795						2800					2805			
Val	Arg	Ser	Ser	Gly	Val	Phe	Gly	Arg	Arg	Leu	Val	Arg	Ala	Pro
2810						2815					2820			
Arg	Ala	Glu	Gly	Ala	Ala	Ser	Trp	Thr	Pro	Thr	Gly	Thr	Val	Leu
2825						2830					2835			
Val	Thr	Gly	Gly	Thr	Gly	Val	Leu	Gly	Gly	Arg	Val	Ala	Arg	Trp
2840						2845					2850			
Leu	Ala	Gly	Ala	Gly	Ala	Glu	Arg	Leu	Val	Leu	Thr	Ser	Arg	Arg
2855						2860					2865			
Gly	Leu	Asp	Ala	Pro	Gly	Thr	Ala	Glu	Leu	Val	Glu	Glu	Leu	Thr
2870						2875					2880			
Ser	Ser	Gly	Val	Glu	Val	Ser	Val	Val	Ala	Cys	Asp	Ala	Ala	Asp
2885						2890					2895			
Arg	Asp	Ala	Leu	Arg	Ala	Leu	Leu	Ser	Ser	Glu	Ala	Gly	Ser	Leu
2900						2905					2910			
Thr	Ala	Val	Ile	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	Val	Leu
2915						2920					2925			
Asp	Ala	Leu	Thr	Pro	Asp	Arg	Ile	Asp	Gly	Val	Val	Arg	Ala	Lys
2930						2935					2940			
Ala	Val	Ser	Ala	Leu	Asn	Leu	His	Glu	Leu	Thr	Ala	Glu	Leu	Gly
2945						2950					2955			
Ile	Glu	Leu	Ser	Ala	Phe	Val	Leu	Phe	Ser	Ser	Met	Ser	Gly	Thr
2960						2965					2970			
Val	Gly	Thr	Ala	Gly	Gln	Ala	Asn	Tyr	Ala	Ala	Ala	Asn	Ala	Tyr
2975						2980					2985			
Leu	Asp	Ala	Leu	Ala	Glu	Gln	Arg	Arg	Ala	Asp	Gly	Leu	Ala	Ala
2990						2995					3000			
Thr	Ser	Ile	Ala	Trp	Gly	Pro	Trp	Ala	Glu	Gly	Gly	Met	Ala	Ala
3005						3010					3015			
Asp	Ala	Ala	Leu	Glu	Ala	Arg	Met	Arg	Arg	Asp	Gly	Val	Pro	Pro
3020						3025					3030			
Met	Pro	Ala	Asp	Pro	Ala	Ile	Arg	Ala	Leu	Arg	Gln	Ala	Val	Ala
3035						3040					3045			
Gly	Asp	Asp	Ala	Val	Leu	Thr	Val	Ala	Asp	Val	Glu	Trp	Asp	Arg
3050						3055					3060			

Phe	Leu	Pro	Gly	Phe	Val	Ala	Ala	Arg	His	Ser	Glu	Leu	Phe	Ser
3065						3070					3075			
Glu	Leu	Arg	Asp	Val	Arg	Asp	Ala	Arg	Ala	Ala	Gln	Asp	Arg	Ala
3080						3085					3090			
Gln	Ala	Ala	Val	Ala	Ala	Asp	Arg	Pro	Asp	Ser	Leu	Ser	Gly	Arg
3095						3100					3105			
Leu	Ser	Ala	Gln	Ala	Pro	Ala	Glu	Gln	Glu	Arg	Glu	Leu	Leu	Asp
3110						3115					3120			
Leu	Val	Arg	Thr	Gln	Val	Ala	Ala	Val	Leu	Gly	His	Ala	Gly	Val
3125						3130					3135			
Glu	Asn	Val	Gly	Ala	Gly	Arg	Ala	Phe	Lys	Glu	Leu	Gly	Phe	Asp
3140						3145					3150			
Ser	Leu	Met	Ala	Val	Glu	Leu	Arg	Asn	Arg	Ile	Gly	Ser	Ala	Thr
3155						3160					3165			
Glu	Leu	Arg	Leu	Pro	Ala	Thr	Leu	Ile	Tyr	Asp	His	Pro	Thr	Ser
3170						3175					3180			
Ala	Ala	Leu	Ala	Glu	Phe	Leu	Arg	Gly	Glu	Leu	Val	Gly	Thr	Val
3185						3190					3195			
Arg	Val	Ala	Asp	Lys	Val	Leu	Pro	Ala	Val	Val	Ser	Ala	Asp	Glu
3200						3205					3210			
Asp	Pro	Ile	Ala	Ile	Val	Ser	Met	Ser	Cys	Arg	Phe	Pro	Gly	Gly
3215						3220					3225			
Val	Arg	Thr	Pro	Glu	Asp	Leu	Trp	Arg	Leu	Leu	Val	Asp	Gly	Thr
3230						3235					3240			
Asp	Ala	Val	Gly	Ala	Phe	Pro	Ala	Asp	Arg	Gly	Trp	Asp	Leu	Asp
3245						3250					3255			
Arg	Leu	Tyr	Ser	Pro	Asp	Pro	Asp	Gln	Pro	Gly	Thr	Ser	Tyr	Thr
3260						3265					3270			
Arg	Glu	Gly	Gly	Phe	Phe	Asp	Gly	Ala	Ala	Asp	Phe	Asp	Pro	Gly
3275						3280					3285			
Phe	Phe	Gly	Ile	Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	Gln
3290						3295					3300			
Gln	Arg	Leu	Leu	Leu	Glu	Thr	Ser	Trp	Glu	Ala	Ile	Glu	Arg	Ala
3305						3310					3315			
Gly	Ile	Asp	Pro	Ser	Ser	Leu	Arg	Gly	Ser	Gln	Ala	Gly	Val	Phe
3320						3325					3330			
Val	Gly	Thr	Asn	Gly	Gln	Asp	Tyr	Leu	Ser	Leu	Ile	Thr	Arg	Glu
3335						3340					3345			
Ser	Glu	Gly	Leu	Glu	Gly	His	Leu	Gly	Thr	Gly	Asn	Ala	Gly	Ser
3350						3355					3360			

Val	Met	Ser	Gly	Arg	Val	Ser	Tyr	Val	Leu	Gly	Leu	Glu	Gly	Pro
	3365					3370					3375			
Ala	Val	Thr	Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu
	3380					3385					3390			
His	Trp	Ala	Ile	Gln	Ala	Leu	Arg	Gln	Gly	Glu	Cys	Ser	Met	Ala
	3395					3400					3405			
Leu	Ala	Gly	Gly	Val	Thr	Val	Met	Ser	Thr	Pro	Glu	Asn	Phe	Val
	3410					3415					3420			
Asp	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ala	Glu	Asp	Gly	Arg	Ile	Lys
	3425					3430					3435			
Ala	Phe	Ala	Ser	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu	Gly	Val
	3440					3445					3450			
Gly	Met	Leu	Leu	Val	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly
	3455					3460					3465			
His	Pro	Val	Leu	Ala	Val	Val	Arg	Gly	Ser	Ala	Val	Asn	Gln	Asp
	3470					3475					3480			
Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln
	3485					3490					3495			
Arg	Val	Ile	Arg	Ala	Ala	Leu	Ala	Ser	Ala	Gly	Leu	Ser	Ala	Ala
	3500					3505					3510			
Asp	Val	Asp	Val	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Lys	Leu	Gly
	3515					3520					3525			
Asp	Pro	Ile	Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp
	3530					3535					3540			
Arg	Pro	Ala	Gly	Arg	Pro	Leu	Trp	Leu	Gly	Ser	Ile	Lys	Ser	Asn
	3545					3550					3555			
Ile	Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Ile	Ile	Lys
	3560					3565					3570			
Met	Val	Leu	Ala	Met	Gln	His	Gly	Val	Leu	Pro	Gln	Thr	Leu	His
	3575					3580					3585			
Val	Asp	Glu	Pro	Thr	Pro	His	Val	Asp	Trp	Ser	Ala	Gly	Glu	Val
	3590					3595					3600			
Thr	Leu	Leu	Thr	Glu	Gln	Thr	Ala	Trp	Pro	Thr	Val	Asp	Arg	Pro
	3605					3610					3615			
Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Ile	Ser	Gly	Thr	Asn	Ala
	3620					3625					3630			
His	Thr	Ile	Ile	Glu	Gln	Ala	Pro	Ala	Val	Glu	Gln	Leu	Ala	Asp
	3635					3640					3645			
Gly	Asp	Ala	Thr	Pro	Ala	Thr	Pro	Ala	Leu	Ala	Leu	Pro	Leu	Pro
	3650					3655					3660			

Tyr	Val	Leu	Ser	Ala	Lys	Ser	Pro	Glu	Ala	Leu	Arg	Ala	Gln	Ala	
	3665					3670					3675				
Ser	Val	Leu	Arg	Thr	His	Leu	Glu	Ala	Thr	Asp	His	Asn	Gly	Pro	
	3680					3685					3690				
Gly	Ser	Asp	Asp	Leu	Ala	Phe	Ser	Leu	Ala	Thr	Ala	Arg	Ala	His	
	3695					3700					3705				
Leu	Glu	His	Arg	Ala	Val	Leu	Thr	Ala	Asp	Asp	Pro	Gln	Glu	Phe	
	3710					3715					3720				
Arg	Glu	Ala	Leu	Ala	Arg	Leu	Ala	Asp	Gly	Asp	Pro	Ser	Pro	Arg	
	3725					3730					3735				
Ile	Thr	Thr	Gly	Ala	Val	Ser	Asp	Gly	Arg	Thr	Ala	Phe	Leu	Phe	
	3740					3745					3750				
Thr	Gly	Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met	Gly	Arg	Glu	Leu	Tyr	
	3755					3760					3765				
Glu	Ala	Tyr	Pro	Val	Phe	Ala	Asp	Ala	Leu	Asp	Ala	Val	Cys	Ala	
	3770					3775					3780				
His	Val	Asp	Ala	His	Leu	Glu	Val	Pro	Leu	Lys	Asp	Val	Leu	Phe	
	3785					3790					3795				
Gly	Ala	Asp	Ala	Gly	Leu	Leu	Asp	Gln	Thr	Ala	Tyr	Thr	Gln	Pro	
	3800					3805					3810				
Ala	Leu	Phe	Ala	Val	Glu	Val	Ala	Leu	Phe	Arg	Leu	Val	Glu	Ser	
	3815					3820					3825				
Trp	Gly	Val	Lys	Pro	Asp	Phe	Val	Ala	Gly	His	Ser	Ile	Gly	Glu	
	3830					3835					3840				
Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe	Ser	Leu	Gln	Asp	Ala	
	3845					3850					3855				
Ser	Glu	Leu	Val	Phe	Ala	Arg	Gly	Arg	Leu	Met	Gln	Ala	Leu	Pro	
	3860					3865					3870				
Thr	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala	Ser	Glu	Asp	Glu	Val	
	3875					3880					3885				
Leu	Pro	Leu	Leu	Thr	Asp	Arg	Val	Ser	Ile	Ala	Ala	Ile	Asn	Gly	
	3890					3895					3900				
Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu	Ala	Asp	Ala	Val	Ala	
	3905					3910					3915				
Ile	Ala	Glu	Ser	Phe	Thr	Asp	Arg	Lys	Ser	Lys	Arg	Leu	Thr	Val	
	3920					3925					3930				
Ser	His	Ala	Phe	His	Ser	Pro	His	Met	Asp	Gly	Met	Leu	Asp	Ala	
	3935					3940					3945				
Phe	Arg	Glu	Ile	Ala	Glu	Gly	Leu	Ser	Tyr	Glu	Pro	Ser	Arg	Ile	
	3950					3955					3960				



Pro	Val	Val	Ser	Asn	Leu	Thr	Gly	Ala	Leu	Val	Ser	Asp	Glu	Met
3965						3970					3975			
Gly	Ser	Ala	Glu	Phe	Trp	Val	Arg	His	Val	Arg	Glu	Ala	Val	Arg
3980						3985					3990			
Phe	Leu	Asp	Gly	Ile	Arg	Thr	Leu	Glu	Ala	Ala	Gly	Val	Thr	Lys
3995						4000					4005			
Tyr	Val	Glu	Leu	Gly	Pro	Asp	Gly	Val	Leu	Ser	Ala	Met	Ala	Gln
4010						4015					4020			
Asp	Cys	Val	Ser	Gly	Glu	Gly	Ser	Val	Phe	Ile	Pro	Val	Leu	Arg
4025						4030					4035			
Lys	Ala	Arg	Pro	Glu	Ala	Glu	Ser	Val	Thr	Thr	Ala	Leu	Ala	Ser
4040						4045					4050			
Ala	His	Val	His	Gly	Ile	Pro	Val	Asp	Trp	Gln	Ala	Tyr	Phe	Ala
4055						4060					4065			
Gly	Thr	Gly	Ala	Gln	Arg	Val	Asp	Leu	Pro	Thr	Tyr	Ala	Phe	Gln
4070						4075					4080			
Arg	Gln	Arg	Tyr	Trp	Pro	Ser	Ala	Ala	Ala	Phe	Val	Thr	Gly	Asp
4085						4090					4095			
Pro	Thr	Ala	Ile	Gly	Leu	Gly	Asp	Ala	Gly	His	Pro	Leu	Leu	Gly
4100						4105					4110			
Ala	Ala	Val	Ala	Leu	Ala	Asp	Ser	Glu	Gly	Val	Leu	Phe	Thr	Gly
4115						4120					4125			
Arg	Leu	Ser	Leu	Asp	Thr	His	Pro	Trp	Leu	Ala	Asp	His	Thr	Ile
4130						4135					4140			
Leu	Gly	Ser	Val	Leu	Leu	Pro	Gly	Thr	Ala	Phe	Val	Asp	Leu	Ala
4145						4150					4155			
Ile	Arg	Ala	Gly	Asp	Gln	Val	Gly	Cys	Asp	Val	Val	Glu	Glu	Leu
4160						4165					4170			
Thr	Leu	Glu	Ala	Pro	Leu	Val	Val	Pro	Gln	Arg	Gly	Gly	Val	Gln
4175						4180					4185			
Leu	Gln	Leu	Val	Val	Glu	Ala	Pro	Ser	Gly	Pro	Gly	Gln	Arg	Pro
4190						4195					4200			
Phe	Ser	Val	His	Ser	Arg	Arg	Gln	Asp	Ala	Tyr	Ala	Glu	Glu	Pro
4205						4210					4215			
Trp	Met	Arg	His	Ala	Ser	Gly	Val	Leu	Thr	Ser	Gly	Val	Ser	Arg
4220						4225					4230			
Arg	Glu	Leu	Ser	Val	Glu	Gly	Gly	Glu	Phe	Glu	Ala	Leu	Ala	Val
4235						4240					4245			
Trp	Pro	Pro	Thr	Gly	Ala	Val	Pro	Val	Asp	Val	Arg	Gly	Leu	Tyr
4250						4255					4260			

Glu	Glu	Leu	Ala	Glu	Ala	Gly	Val	Ala	Tyr	Gly	Pro	Leu	Phe	Gln
4265						4270					4275			
Gly	Leu	Lys	Ala	Ala	Trp	Arg	Arg	Asp	Gly	Glu	Leu	Phe	Thr	Glu
4280						4285					4290			
Val	Ala	Leu	Pro	Gly	Glu	Ala	Arg	Arg	Glu	Ala	Ala	Arg	Phe	Gly
4295						4300					4305			
Leu	His	Pro	Ala	Leu	Leu	Asp	Ala	Gly	Leu	His	Ala	Ile	Gly	His
4310						4315					4320			
Gly	Glu	Gly	Pro	Glu	Pro	Ala	Met	Thr	Gly	Ala	Leu	Leu	Pro	Phe
4325						4330					4335			
Ser	Trp	Ala	Gly	Val	Ser	Leu	Tyr	Ala	Ala	Gly	Ala	Ser	Ser	Leu
4340						4345					4350			
Arg	Met	Arg	Leu	Thr	Pro	His	Thr	Pro	Asp	Asp	Ala	His	Thr	Met
4355						4360					4365			
Ala	Leu	Leu	Val	Ala	Asp	Glu	Thr	Gly	Arg	Pro	Val	Ala	Ala	Val
4370						4375					4380			
Glu	Ser	Leu	Ile	Leu	Arg	Thr	Ala	Ser	Ala	Asp	Gln	Val	Arg	Ala
4385						4390					4395			
Ala	Asp	Gly	Gly	His	Leu	Asp	Ser	Leu	Phe	Lys	Val	Glu	Trp	Leu
4400						4405					4410			
Pro	Val	Ala	Gly	Gly	Ala	Thr	Pro	His	Gly	Asp	Ser	Thr	Gly	Arg
4415						4420					4425			
Arg	Trp	Ala	Val	Leu	Gly	Arg	Asp	Gly	Leu	Gly	Leu	Pro	Ala	Thr
4430						4435					4440			
Gly	Val	Gln	Gly	Gln	Val	Ala	Glu	Tyr	Asp	Asp	Ala	Ser	Ala	Leu
4445						4450					4455			
Gly	Ala	Ala	Leu	Ala	Ala	Gly	Glu	Pro	Val	Pro	Asp	Ala	Val	Phe
4460						4465					4470			
Val	His	Pro	Gly	Ala	Leu	Pro	Gly	Gln	Asp	Thr	Asp	Thr	Thr	Ala
4475						4480					4485			
Ala	Ser	Val	His	Ala	Ala	Val	Thr	Asp	Ala	Leu	Ser	Phe	Val	Gln
4490						4495					4500			
Glu	Trp	Leu	Ala	Asp	Glu	Arg	Phe	Ala	Ala	Thr	Arg	Leu	Val	Trp
4505						4510					4515			
Leu	Thr	Ser	Gly	Ala	Val	Ala	Asp	Glu	Pro	Gly	Ala	Gly	Val	Arg
4520						4525					4530			
Asp	Leu	Ala	Gly	Ser	Ala	Val	Arg	Gly	Leu	Leu	Arg	Ser	Ala	Gln
4535						4540					4545			
Ser	Glu	Asn	Pro	Gly	Gln	Leu	Leu	Met	Leu	Asp	Leu	Asp	Gln	Asp
4550						4555					4560			

Pro	Ala	Ser	Leu	Ala	Ala	Leu	Pro	Ala	Ala	Leu	Ala	Ala	Gly	Glu
4565						4570					4575			
Pro	Glu	Leu	Ala	Ile	Arg	Arg	Gly	Glu	Leu	Arg	Thr	Pro	Arg	Leu
4580						4585					4590			
Thr	Arg	Val	Pro	Ser	Ala	Asp	Ala	Ala	Ala	Glu	Pro	Leu	Gly	Thr
4595						4600					4605			
Leu	Gly	Asp	Pro	Ser	Gly	Thr	Val	Leu	Val	Thr	Gly	Ala	Thr	Gly
4610						4615					4620			
Thr	Leu	Gly	Gly	Leu	Phe	Ala	Arg	His	Leu	Val	Thr	Ala	Tyr	Gly
4625						4630					4635			
Val	Arg	Arg	Leu	Leu	Leu	Thr	Ser	Arg	Arg	Gly	Pro	Glu	Ala	Glu
4640						4645					4650			
Gly	Ala	Ala	Glu	Leu	Val	Ala	Glu	Leu	Glu	Gln	Leu	Gly	Ala	His
4655						4660					4665			
Val	Glu	Leu	Val	Ala	Cys	Asp	Ala	Ala	Asp	Arg	Ser	Ala	Leu	Ala
4670						4675					4680			
Ala	Leu	Leu	Gly	Ala	Val	Pro	Ser	Glu	His	Pro	Leu	Thr	Ala	Val
4685						4690					4695			
Val	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	Ile	Leu	Ser	Ser	Leu
4700						4705					4710			
Thr	Pro	Glu	Arg	Val	Ala	Ala	Val	Leu	Arg	Pro	Lys	Val	Asp	Ala
4715						4720					4725			
Ala	Trp	Asn	Leu	His	Glu	Leu	Thr	Arg	Glu	Leu	Gly	Leu	Ser	Ala
4730						4735					4740			
Phe	Val	Leu	Phe	Ser	Gly	Ala	Ala	Ala	Ala	Phe	Gly	Ala	Ala	Gly
4745						4750					4755			
Gln	Gly	Asn	Tyr	Ala	Ala	Ala	Asn	Ser	Phe	Leu	Glu	Ala	Leu	Ala
4760						4765					4770			
Glu	Gln	Arg	Arg	Ala	Glu	Gly	Leu	Pro	Ala	Thr	Ser	Leu	Ala	Trp
4775						4780					4785			
Gly	Leu	Trp	Ala	Pro	Gln	Thr	Gly	Gly	Met	Ala	Gln	Gln	Leu	Asp
4790						4795					4800			
Glu	Val	Asp	Leu	Arg	Arg	Ile	Ala	Arg	Asp	Gly	Val	Gly	Gly	Leu
4805						4810					4815			
Ser	Gly	Asp	Glu	Gly	Leu	Gly	Leu	Phe	Asp	Thr	Ala	Met	Thr	Val
4820						4825					4830			
Asp	Ala	Ala	Val	Leu	Leu	Pro	Met	Arg	Leu	Asp	Leu	Ala	Val	Ala
4835						4840					4845			
Arg	Ala	Gln	Ala	Val	Ser	Thr	Gly	Glu	Thr	Pro	Ala	Leu	Leu	Arg
4850						4855					4860			

Ala Leu Ile Arg Val Pro	Ala Arg Arg Ala Val	Glu Gln Arg Thr
4865	4870	4875
Ala Ala Asp Gly Ala Ser	Pro Leu Ala Ala Arg	Leu Ser Ala Leu
4880	4885	4890
Pro Asp Ala Glu Arg Glu	Asp Met Leu Leu Asp	Leu Val Cys Gly
4895	4900	4905
Arg Val Ala Glu Val Leu	Gly His Thr Asp Ala	Arg Ala Val Asp
4910	4915	4920
Ala Asp Arg Ala Phe Lys	Glu Leu Gly Phe Asp	Ser Leu Thr Ala
4925	4930	4935
Val Glu Leu Arg Asn Val	Leu Lys Ala Ala Thr	Gly Leu Arg Leu
4940	4945	4950
Ser Pro Thr Leu Val Phe	Asp Tyr Pro Thr Pro	Val Ala Leu Ala
4955	4960	4965
Arg His Leu Leu Ala Glu	Leu Ala Gly Thr Ala	Asp Asp Gln Asp
4970	4975	4980
Ala Val Arg Gly Arg Lys	Ala Pro Ala Arg Pro	Ala Thr Ala Ala
4985	4990	4995
Val Thr Ser Val Thr Gly	Glu Asp Pro Ile Val	Ile Val Gly Met
5000	5005	5010
Gly Cys Arg Phe Pro Gly	Gly Val Arg Ser Pro	Glu Asp Leu Trp
5015	5020	5025
Gln Leu Val Ala Thr Gly	Gly Asp Gly Ile Thr	Gly Phe Pro Ser
5030	5035	5040
Asp Arg Gly Trp Asn Val	Glu Ala Leu Tyr His	Pro Asp Pro Asp
5045	5050	5055
His Ala Gly Thr Ser Tyr	Thr Arg Glu Gly Gly	Phe Leu His Asp
5060	5065	5070
Ala Ala Asp Phe Asp Pro	Gly Phe Phe Gly Ile	Ser Pro Arg Glu
5075	5080	5085
Ala Leu Ala Met Asp Pro	Gln Gln Arg Leu Leu	Leu Glu Thr Ser
5090	5095	5100
Trp Glu Ala Phe Glu Arg	Ala Gly Ile Asp Pro	Ala Thr Leu Arg
5105	5110	5115
Gly Ser Arg Thr Gly Val	Phe Ala Gly Val Met	Tyr His Asp Tyr
5120	5125	5130
Val Thr Gly Ile Gly Asp	Gly Gly Ser Ala Val	Glu Leu Pro Glu
5135	5140	5145
Gly Val Glu Gly Tyr Leu	Gly Thr Gly Asn Ala	Gly Ser Ile Ala
5150	5155	5160

Ser	Gly	Arg	Ile	Ala	Tyr	Thr	Phe	Gly	Leu	Glu	Gly	Pro	Ala	Val
5165						5170					5175			
Thr	Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Trp
5180						5185					5190			
Ala	Ile	Gln	Ala	Leu	Arg	Ser	Gly	Glu	Cys	Thr	Met	Ala	Leu	Ala
5195						5200					5205			
Gly	Gly	Val	Ala	Val	Met	Ala	Thr	Pro	Glu	Thr	Phe	Val	Asp	Phe
5210						5215					5220			
Ser	Arg	Gln	Arg	Gly	Leu	Ser	Ala	Asp	Gly	Arg	Cys	Lys	Ser	Phe
5225						5230					5235			
Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Ala	Glu	Gly	Ala	Gly	Met
5240						5245					5250			
Leu	Leu	Val	Glu	Arg	Leu	Ser	Asp	Ala	Glu	Arg	Asn	Gly	His	Pro
5255						5260					5265			
Val	Leu	Ala	Val	Val	Arg	Gly	Ser	Ala	Ile	Asn	Gln	Asp	Gly	Ala
5270						5275					5280			
Ser	Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val
5285						5290					5295			
Ile	Arg	Glu	Ala	Leu	Ala	Ser	Ala	Asp	Leu	Ser	Ala	Ala	Asp	Ile
5300						5305					5310			
Asp	Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp	Pro
5315						5320					5325			
Ile	Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Arg	Glu	Arg	Glu
5330						5335					5340			
Ala	Gly	Arg	Pro	Leu	Trp	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Ile	Gly
5345						5350					5355			
His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Ile	Ile	Lys	Met	Val
5360						5365					5370			
Met	Ala	Met	Arg	His	Gly	Val	Leu	Pro	Gln	Thr	Leu	His	Val	Asp
5375						5380					5385			
Glu	Pro	Ser	Pro	Gln	Val	Asp	Trp	Glu	Ala	Gly	Glu	Val	Ser	Leu
5390						5395					5400			
Leu	Thr	Gly	Ala	Met	Pro	Trp	Pro	Gln	Thr	Gly	Arg	Pro	Arg	Arg
5405						5410					5415			
Ala	Gly	Val	Ser	Ser	Phe	Gly	Ile	Ser	Gly	Thr	Asn	Ala	His	Thr
5420						5425					5430			
Ile	Ile	Glu	Gln	Pro	Pro	Thr	Arg	Glu	Val	Thr	Pro	Thr	Val	Pro
5435						5440					5445			
Val	Ala	Pro	Val	Val	Pro	Thr	Val	Pro	Thr	Val	Pro	Val	Val	Pro
5450						5455					5460			

Trp	Val	Leu	Ser	Gly	Lys	Gly	Glu	Glu	Ala	Leu	Arg	Ala	Gln	Ala
5465						5470					5475			
Arg	Gln	Leu	Gln	Ser	Tyr	Val	Leu	Arg	Ala	Pro	Glu	Leu	Arg	Pro
5480						5485					5490			
Val	Asp	Ile	Ala	Gly	Ser	Leu	Ala	Val	Gly	Arg	Ala	Ser	Phe	Glu
5495						5500					5505			
Asp	Arg	Ala	Ala	Val	Val	Ala	Ala	Asp	Arg	Glu	Gly	Leu	Leu	Ala
5510						5515					5520			
Ala	Leu	Ala	Ala	Leu	Ala	Asp	Gly	Gly	Ser	Ala	Thr	Gly	Ala	Val
5525						5530					5535			
Glu	Gly	Ser	Ala	Val	Gly	Gly	Lys	Leu	Ala	Phe	Leu	Phe	Thr	Gly
5540						5545					5550			
Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met	Gly	Arg	Glu	Leu	Tyr	Glu	Ala
5555						5560					5565			
Tyr	Pro	Val	Phe	Ala	Glu	Ala	Leu	Asp	Ala	Val	Cys	Ala	Arg	Leu
5570						5575					5580			
Glu	Leu	Pro	Leu	Lys	Asp	Val	Leu	Phe	Gly	Ala	Asp	Ala	Gly	Leu
5585						5590					5595			
Leu	Asp	Glu	Thr	Ala	Tyr	Thr	Gln	Pro	Ala	Leu	Phe	Ala	Val	Glu
5600						5605					5610			
Val	Ala	Leu	Phe	Arg	Leu	Val	Glu	Ser	Trp	Gly	Leu	Arg	Pro	Asp
5615						5620					5625			
Phe	Val	Ala	Gly	His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val
5630						5635					5640			
Ala	Gly	Val	Phe	Ser	Leu	Asp	Asp	Ala	Cys	Ala	Leu	Val	Glu	Ala
5645						5650					5655			
Arg	Gly	Arg	Leu	Met	Gly	Ala	Leu	Pro	Ala	Gly	Gly	Val	Met	Ile
5660						5665					5670			
Ala	Val	Gln	Ala	Ser	Glu	Asp	Glu	Val	Leu	Pro	Leu	Leu	Thr	Asp
5675						5680					5685			
Arg	Val	Ser	Ile	Ala	Ala	Ile	Asn	Gly	Pro	Arg	Ser	Val	Val	Ile
5690						5695					5700			
Ala	Gly	Asp	Glu	Ala	Asp	Ala	Val	Ala	Ile	Val	Glu	Ser	Phe	Thr
5705						5710					5715			
Gly	Arg	Lys	Ser	Lys	Arg	Leu	Thr	Val	Ser	His	Ala	Phe	His	Ser
5720						5725					5730			
Pro	His	Met	Asp	Gly	Met	Leu	Glu	Asp	Phe	Arg	Ala	Val	Ala	Glu
5735						5740					5745			
Gly	Leu	Ser	Tyr	Glu	Ala	Pro	Arg	Ile	Pro	Val	Val	Ser	Asn	Leu
5750						5755					5760			

Thr Gly	Thr Leu Val	Thr Asp	Glu Met Gly Ser	Ala	Glu Phe Trp
5765		5770		5775	
Val Arg	His Val Arg Glu	Ala	Val Arg Phe Leu	Asp	Gly Ile Arg
5780		5785		5790	
Ala Leu	Glu Ala Ala Gly	Val	Thr Thr Tyr Val	Glu	Leu Gly Pro
5795		5800		5805	
Gly Gly	Val Leu Ser Ala	Leu	Ala Gln Glu Cys	Val	Ser Gly Asp
5810		5815		5820	
Gly Ala	Ala Phe Val Pro	Val	Leu Arg Ser Gly	Arg	Ser Glu Ala
5825		5830		5835	
Glu Thr	Ala Val Thr Ala	Leu	Ala Gln Ala His	Val	Arg Gly Val
5840		5845		5850	
Asn Val	Asp Trp Ala Ala	Phe	Phe Ala Gly Thr	Gly	Ala Glu Arg
5855		5860		5865	
Val Asp	Leu Pro Thr Tyr	Ala	Phe Gln Arg Gln	Arg	Tyr Trp Leu
5870		5875		5880	
His Ile	Pro Arg Val Ala	Gln	Ser Gly Val Ala	Asp	Glu Val Asp
5885		5890		5895	
Ala Arg	Phe Trp Asp Ala	Val	Glu Arg Glu Asp	Leu	Glu Ser Leu
5900		5905		5910	
Ala Ser	Thr Leu Glu Val	Asp	Asp Glu Ser Ala	Trp	Ser Ser Val
5915		5920		5925	
Leu Pro	Ala Leu Ser Ala	Trp	Arg Arg Glu Arg	Arg	Ala Gln Ser
5930		5935		5940	
Glu Val	Asp Gly Trp Arg	Tyr	Arg Val Ser Trp	Lys	Pro Leu Ala
5945		5950		5955	
Glu Val	Ser Ala Ser Gly	Leu	Ser Gly Ser Trp	Val	Val Ile Ser
5960		5965		5970	
Pro Ala	Gly Ser Val Asp	Asp	Ser Ala Val Val	Ser	Ala Leu Val
5975		5980		5985	
Gly Arg	Gly Ala Glu Val	Arg	Arg Val Val Val	Glu	Ala Gly Val
5990		5995		6000	
Asp Arg	Ser Ala Leu Ala	Gly	Leu Leu Ala Asp	Ala	Gly Ser Ala
6005		6010		6015	
Ala Gly	Val Val Ser Leu	Leu	Gly Leu Asp Glu	Ser	Glu Gly Leu
6020		6025		6030	
Leu Gly	Thr Val Gly Leu	Val	Gln Ala Leu Gly	Asp	Ala Gly Val
6035		6040		6045	
Glu Ala	Pro Leu Trp Cys	Leu	Thr Arg Gly Ala	Val	Ser Val Gly
6050		6055		6060	

Arg	Ser	Asp	Arg	Leu	Val	Ser	Pro	Val	Gln	Ala	Gln	Val	Trp	Gly
6065						6070					6075			
Leu	Gly	Arg	Val	Ala	Ala	Leu	Glu	Val	Pro	Glu	Arg	Trp	Gly	Gly
6080						6085					6090			
Leu	Val	Asp	Leu	Pro	Glu	Val	Leu	Asp	Glu	Arg	Ala	Val	Ala	Arg
6095						6100					6105			
Leu	Val	Gly	Val	Leu	Ala	Gly	Ser	Gly	Glu	Asp	Gln	Val	Ala	Val
6110						6115					6120			
Arg	Ser	Ser	Gly	Val	Phe	Gly	Arg	Arg	Leu	Val	Arg	Ala	Pro	Arg
6125						6130					6135			
Ala	Glu	Gly	Ala	Ser	Ala	Trp	Thr	Pro	Thr	Gly	Thr	Val	Leu	Val
6140						6145					6150			
Thr	Gly	Gly	Thr	Gly	Val	Leu	Gly	Gly	Arg	Val	Ala	Arg	Trp	Leu
6155						6160					6165			
Ala	Gly	Ala	Gly	Ala	Glu	Arg	Leu	Val	Leu	Thr	Ser	Arg	Arg	Gly
6170						6175					6180			
Pro	Asp	Ala	Pro	Gly	Ala	Ala	Glu	Leu	Val	Glu	Glu	Leu	Thr	Thr
6185						6190					6195			
Gly	Phe	Gly	Val	Glu	Val	Ser	Val	Val	Ala	Cys	Asp	Ala	Ala	Asp
6200						6205					6210			
Arg	Asp	Ala	Leu	Arg	Thr	Leu	Leu	Ser	Ala	Glu	Ala	Gly	Thr	Leu
6215						6220					6225			
Thr	Ala	Val	Ile	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	Val	Leu
6230						6235					6240			
Asp	Ala	Leu	Thr	Pro	Asp	Arg	Ile	Asp	Ser	Val	Leu	Arg	Ala	Lys
6245						6250					6255			
Ala	Val	Ser	Ala	Phe	Asn	Leu	His	Glu	Leu	Thr	Ala	Glu	Leu	Gly
6260						6265					6270			
Ile	Glu	Leu	Ser	Ala	Phe	Val	Leu	Phe	Ser	Ser	Met	Ser	Gly	Thr
6275						6280					6285			
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Asn Gly Val Gly Ser Pro Glu Asp Leu Trp Arg Leu Val Asp Glu Gly
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Phe	Arg	Leu	Val	Glu	Ser	Trp	Gly	Leu	Lys	Pro	Asp	Phe	Leu	Ala	Gly		
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His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe	Ser		
			660					665					670				
Leu	Asp	Asp	Ala	Cys	Ala	Leu	Val	Ser	Ala	Arg	Gly	Arg	Leu	Met	Gly		
		675					680					685					
Ala	Leu	Pro	Gly	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala	Ser	Glu	Asp		
	690					695					700						
Glu	Val	Leu	Pro	Leu	Leu	Thr	Asp	Arg	Val	Ser	Ile	Ala	Ala	Ile	Asn		
705					710					715					720		
Gly	Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu	Ala	Asp	Ala	Val	Ala		
			725						730					735			
Ile	Ala	Glu	Ser	Phe	Ala	Asp	Arg	Lys	Ser	Lys	Arg	Leu	Thr	Val	Ser		
			740					745					750				
His	Ala	Phe	His	Ser	Pro	His	Met	Asp	Gly	Met	Leu	Glu	Asp	Phe	Arg		
		755					760					765					
Val	Val	Ala	Glu	Gly	Leu	Ser	Tyr	Glu	Ala	Pro	Arg	Ile	Pro	Val	Val		
	770					775					780						
Ser	Asn	Leu	Thr	Gly	Ala	Leu	Val	Ser	Asp	Glu	Met	Gly	Ser	Ala	Asp		
785				790					795						800		
Phe	Trp	Val	Arg	His	Val	Arg	Glu	Thr	Val	Arg	Phe	Leu	Asp	Gly	Ile		
				805					810					815			
Arg	Thr	Leu	Glu	Ala	Ala	Gly	Val	Thr	Lys	Tyr	Val	Glu	Leu	Gly	Pro		
		820						825					830				
Asp	Gly	Val	Leu	Ser	Ala	Leu	Ala	Gln	Asp	Cys	Val	Ser	Gly	Glu	Asp		
		835					840					845					
Ser	Val	Phe	Ile	Pro	Val	Leu	Arg	Lys	Ala	Arg	Pro	Glu	Ala	Glu	Thr		
	850					855					860						
Val	Ala	Thr	Ala	Leu	Ala	Ser	Ala	His	Val	His	Gly	Ile	Pro	Val	Asp		
865					870					875					880		
Trp	Arg	Ala	Tyr	Phe	Ala	Gly	Thr	Gly	Ala	Gln	Arg	Val	Asp	Leu	Pro		
				885					890					895			
Thr	Tyr	Pro	Phe	Gln	Arg	Gln	Arg	Tyr	Trp	Ile	Glu	Pro	Gly	Gly	Arg		
		900						905					910				
Ala	Gly	Asp	Val	Gly	Ala	Ala	Gly	Leu	Glu	Glu	Ala	Gly	His	Pro	Leu		
		915					920					925					
Leu	Gly	Ala	Ala	Val	Pro	Leu	Ala	Asp	Ser	Glu	Gly	Phe	Leu	Phe	Thr		
	930					935					940						
Gly	Arg	Leu	Gly	Arg	Thr	Ser	His	Pro	Trp	Leu	Ala	Asp	His	Ala	Val		
945					950					955					960		



Met	Asp	Thr	Val	Leu	Leu	Pro	Gly	Thr	Ala	Phe	Val	Asp	Leu	Ala	Val	965	970	975
Arg	Ala	Gly	Asp	Gln	Val	Gly	Cys	Asp	Val	Val	Glu	Glu	Leu	Thr	Leu	980	985	990
Glu	Ala	Pro	Leu	Val	Leu	Pro	Glu	Arg	Gly	Ala	Val	Gln	Ile	Gln	Met	995	1000	1005
His	Val	Gly	Ala	Pro	Asp	Ala	Asp	Gly	Thr	Gly	Arg	Arg	Thr	Phe		1010	1015	1020
Thr	Leu	Ser	Ser	Arg	Thr	Gln	Asp	Gly	Ala	Ala	Asp	Glu	Pro	Trp		1025	1030	1035
Thr	Arg	His	Ala	Gly	Gly	Val	Leu	Ala	His	Gly	Ala	Ala	Gln	Pro		1040	1045	1050
Ala	Phe	Ala	Pro	Val	Gln	Trp	Pro	Pro	Ala	Gly	Ala	Glu	Pro	Ile		1055	1060	1065
Pro	Thr	Glu	Ser	Leu	Tyr	Ala	Asp	Leu	Ala	Glu	Val	Gly	Met	Gly		1070	1075	1080
Tyr	Gly	Pro	Ala	Phe	Arg	Gly	Leu	Thr	Ala	Ala	Trp	Arg	His	Gly		1085	1090	1095
Glu	Ser	Val	Tyr	Val	Glu	Val	Ala	Leu	Pro	Glu	Glu	Thr	Ala	Ser		1100	1105	1110
Thr	Ala	Arg	Asp	Phe	Gly	Leu	His	Pro	Ala	Leu	Leu	Asp	Ala	Ala		1115	1120	1125
Leu	His	Ala	Leu	Gly	Leu	Gly	Val	Leu	Gly	Gly	Val	Glu	Gly	Glu		1130	1135	1140
Gly	Arg	Leu	Pro	Phe	Ala	Trp	Ser	Gly	Val	Thr	Leu	His	Ala	Ala		1145	1150	1155
Gly	Ala	Asp	Ala	Leu	Arg	Val	His	Leu	Ala	Pro	Ala	Gly	Ala	His		1160	1165	1170
Gly	Val	Arg	Leu	Glu	Ile	Ala	Asp	Ala	Ala	Gly	Ala	Pro	Val	Ala		1175	1180	1185
Thr	Val	Asp	Ser	Leu	Val	Leu	Arg	Thr	Val	Ser	Glu	Glu	Gln	Val		1190	1195	1200
Arg	Ala	Ala	Arg	Thr	Ala	Tyr	His	Glu	Ser	Val	Phe	Arg	Ala	Glu		1205	1210	1215
Trp	Thr	Ala	Leu	Pro	Thr	Ala	Ala	Glu	Ser	Ala	Ala	Thr	His	Gly		1220	1225	1230
Arg	Trp	Ala	Val	Leu	Gly	Ala	Ala	Asp	Ala	Gly	Asp	Ser	Pro	Arg		1235	1240	1245
Asp	Ala	Leu	Val	Asn	Gly	Leu	Leu	Gly	His	Leu	Pro	Gly	Glu	Val		1250	1255	1260

Ala	Arg	Tyr	Ala	Asp	Leu	Ala	Glu	Leu	Ala	Ala	Ala	Val	Glu	Ala
1265						1270						1275		
Gly	Ala	Ala	Thr	Pro	Asp	Ala	Val	Phe	Ala	Ala	Tyr	Ala	Arg	Ser
1280						1285						1290		
Asp	Asp	Asp	Gly	Pro	Ala	Ala	Pro	Asp	Val	Ser	Ala	Pro	Asp	Val
1295						1300						1305		
Ser	Ala	Gln	Ala	Val	His	Ala	Ala	Thr	His	Asp	Ala	Leu	Ala	Leu
1310						1315						1320		
Val	Gln	Thr	Trp	Phe	Gly	Glu	Glu	Pro	Phe	Ala	Gly	Asp	Arg	Phe
1325						1330						1335		
Ala	Ala	Thr	Arg	Leu	Val	Val	Leu	Thr	Arg	Gly	Ala	Val	Ala	Ala
1340						1345						1350		
Gly	Asp	Gly	Asp	Thr	Val	Thr	Asp	Pro	Ala	His	Ala	Ala	Val	Trp
1355						1360						1365		
Gly	Leu	Leu	Arg	Ser	Ala	Gln	Ser	Glu	Tyr	Pro	Asp	Arg	Leu	Leu
1370						1375						1380		
Leu	Ile	Asp	Thr	Asp	Gly	Val	Glu	Asp	Ser	Val	His	Ala	Leu	Pro
1385						1390						1395		
Ala	Val	Leu	Ala	Val	Gly	Glu	Pro	Gln	Leu	Ala	Leu	Arg	Ala	Gly
1400						1405						1410		
Ser	Val	His	Ala	Leu	Arg	Leu	Ala	Arg	Val	Ala	Ala	Ala	Thr	Pro
1415						1420						1425		
Glu	Asp	Ala	Ala	Ala	Pro	Thr	Gln	Tyr	Ala	Pro	Gly	Ser	Thr	Val
1430						1435						1440		
Leu	Ile	Thr	Gly	Ala	Gly	Gly	Met	Leu	Gly	Gly	Leu	Ile	Ala	Arg
1445						1450						1455		
Arg	Leu	Val	Ala	Glu	His	Gly	Val	Arg	His	Leu	Leu	Leu	Val	Gly
1460						1465						1470		
Arg	Arg	Gly	Ala	Ala	Ala	Pro	Gly	Ala	Glu	Gln	Leu	Ser	Ala	Glu
1475						1480						1485		
Leu	Ala	Glu	Ala	Gly	Ala	Ser	Val	Thr	Trp	Ala	Ala	Cys	Asp	Val
1490						1495						1500		
Ala	Asp	Arg	Asp	Ala	Leu	Ser	Ala	Val	Leu	His	Ala	Ile	Pro	Ala
1505						1510						1515		
Glu	His	Pro	Leu	Gly	Ala	Val	Val	His	Thr	Ala	Gly	Val	Leu	Asp
1520						1525						1530		
Asp	Gly	Val	Ile	Ala	Ser	Leu	Thr	Pro	Glu	Arg	Leu	Ser	Ala	Val
1535						1540						1545		
Leu	Arg	Pro	Lys	Val	Asp	Ala	Ala	Cys	Asn	Leu	His	Glu	Leu	Thr
1550						1555						1560		

Arg	His	Leu	Asp	Leu	Thr	Ala	Phe	Val	Leu	Phe	Ser	Ser	Ile	Gly
1565						1570					1575			
Gly	Val	Phe	Gly	Gly	Pro	Gly	Gln	Gly	Asn	Tyr	Ala	Ala	Ala	Asn
1580						1585					1590			
Val	Phe	Leu	Asp	Ala	Leu	Ala	Gln	His	Arg	Arg	Ser	Gln	Gly	Leu
1595						1600					1605			
Ala	Ala	Thr	Ser	Leu	Ala	Trp	Ala	Leu	Trp	Ala	Asp	Ser	Thr	Gly
1610						1615					1620			
Met	Ala	Gly	Ser	Leu	Asp	Glu	Ala	Asp	Ile	Ser	Arg	Met	Arg	Arg
1625						1630					1635			
Gly	Gly	Leu	Pro	Pro	Leu	Thr	Thr	Ala	Glu	Gly	Leu	Glu	Leu	Phe
1640						1645					1650			
Asp	Leu	Ala	His	Arg	Ile	Asp	Glu	Ala	Ala	Pro	Val	Leu	Met	Arg
1655						1660					1665			
Ala	Asp	Leu	Thr	Ala	Leu	Arg	Thr	Gln	Ala	Gln	Ala	Gly	Thr	Met
1670						1675					1680			
Ser	Pro	Leu	Leu	Arg	Gly	Leu	Val	Arg	Val	Pro	Ala	Arg	Arg	Ser
1685						1690					1695			
Ala	Ser	Gly	Ala	Ala	Gly	Thr	Gly	Gly	Glu	Ser	Gly	Leu	Arg	Glu
1700						1705					1710			
Arg	Leu	Ala	Gly	Leu	Ser	Ala	Ala	Glu	Arg	Asp	Arg	Thr	Leu	Leu
1715						1720					1725			
Asp	Leu	Val	Arg	Lys	Gln	Val	Ala	Ala	Ala	Leu	Gly	Tyr	Pro	Gly
1730						1735					1740			
Pro	Ser	Ala	Val	Glu	Pro	Gly	Arg	Ser	Phe	Lys	Glu	Leu	Gly	Phe
1745						1750					1755			
Asp	Ser	Leu	Thr	Ala	Val	Glu	Leu	Arg	Asn	Leu	Leu	Gly	Asp	Ala
1760						1765					1770			
Thr	Gly	Arg	Arg	Leu	Pro	Ala	Thr	Leu	Val	Phe	Asp	Tyr	Pro	Thr
1775						1780					1785			
Ala	Thr	Ala	Leu	Ala	Gly	Tyr	Leu	Arg	Glu	Glu	Ile	Ile	Gly	Asp
1790						1795					1800			
Leu	Ala	Asp	Ala	Val	Thr	Ala	Pro	Ala	Leu	Val	Pro	Ser	Ala	Ala
1805						1810					1815			
Val	Ala	Gly	Ala	Gly	Ala	Gly	Ala	Asp	Asp	Asp	Asp	Pro	Ile	Ala
1820						1825					1830			
Ile	Val	Ala	Met	Ser	Cys	Arg	Phe	Pro	Gly	Gly	Ile	Ala	Ser	Pro
1835						1840					1845			
Glu	Asp	Leu	Trp	Gln	Leu	Leu	Val	Thr	Gly	Arg	Asp	Gly	Ile	Thr
1850						1855					1860			

Gly	Phe	Pro	Ala	Asp	Arg	Gly	Trp	Asp	Leu	Asp	Ser	Leu	Tyr	Ser
1865						1870					1875			
Asp	Asp	Pro	Asp	Arg	Glu	Gly	Thr	Ser	Tyr	Ala	Arg	Glu	Gly	Gly
1880						1885					1890			
Phe	Leu	His	Glu	Ala	Ala	Glu	Phe	Asp	Ala	Ser	Phe	Phe	Gly	Ile
1895						1900					1905			
Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Leu
1910						1915					1920			
Leu	Glu	Thr	Thr	Trp	Glu	Thr	Phe	Glu	Arg	Ala	Gly	Ile	Asp	Pro
1925						1930					1935			
Thr	Ser	Leu	Arg	Gly	Ser	Arg	Thr	Gly	Val	Phe	Val	Gly	Ser	Asn
1940						1945					1950			
Ala	Gln	Asp	Tyr	Leu	Gln	Leu	Trp	Leu	Asn	Asp	Ala	Asp	Gly	Leu
1955						1960					1965			
Glu	Gly	His	Leu	Gly	Thr	Gly	Asn	Ala	Ala	Ser	Val	Val	Ser	Gly
1970						1975					1980			
Arg	Leu	Ser	Tyr	Thr	Phe	Gly	Leu	Glu	Gly	Pro	Ala	Val	Thr	Val
1985						1990					1995			
Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Thr	Leu	His	Leu	Ala	Ala
2000						2005					2010			
Gln	Ala	Leu	Arg	Arg	Gly	Glu	Cys	Ser	Met	Ala	Leu	Ala	Gly	Ala
2015						2020					2025			
Val	Thr	Ile	Met	Ser	Thr	Pro	Gly	Ala	Phe	Thr	Glu	Phe	Ser	Arg
2030						2035					2040			
Gln	Arg	Gly	Leu	Ala	Ala	Asp	Gly	Arg	Ile	Lys	Ala	Phe	Ala	Ala
2045						2050					2055			
Ala	Ala	Asp	Gly	Thr	Ser	Trp	Ser	Glu	Gly	Val	Gly	Leu	Leu	Leu
2060						2065					2070			
Val	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly	His	Pro	Val	Leu
2075						2080					2085			
Ala	Val	Val	Arg	Gly	Thr	Ala	Val	Asn	Gln	Asp	Gly	Ala	Ser	Asn
2090						2095					2100			
Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val	Ile	Arg
2105						2110					2115			
Glu	Ala	Leu	Ala	Asp	Ala	Gly	Leu	Ser	Ala	Ala	Glu	Val	Asp	Ala
2120						2125					2130			
Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Thr	Leu	Gly	Asp	Pro	Ile	Glu
2135						2140					2145			
Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Gly	Arg	Pro	Asp	Asp
2150						2155					2160			

Gln	Pro	Leu	Trp	Leu	Gly	Ser	Val	Lys	Ser	Asn	Ile	Gly	His	Thr
2165						2170					2175			
Gln	Ala	Val	Ala	Gly	Ala	Ala	Gly	Ile	Ile	Lys	Met	Val	Met	Ala
2180						2185					2190			
Met	Arg	His	Gly	Val	Leu	Pro	Gln	Thr	Leu	His	Ile	Asp	Glu	Pro
2195						2200					2205			
Thr	Pro	Tyr	Val	Asp	Trp	Ser	Ala	Gly	Asp	Ile	Ala	Leu	Leu	Thr
2210						2215					2220			
Glu	Gln	Arg	Ala	Trp	Pro	Glu	Thr	Gly	Arg	Pro	Arg	Arg	Ala	Gly
2225						2230					2235			
Val	Ser	Ser	Phe	Gly	Tyr	Ser	Gly	Thr	Asn	Ala	His	Ala	Val	Ile
2240						2245					2250			
Glu	Gln	Ala	Pro	Gln	Asn	Ala	Met	Glu	Arg	Thr	Pro	Gln	Gly	Asp
2255						2260					2265			
Asn	Leu	Pro	Ala	Arg	Thr	Pro	Ala	Thr	Arg	Thr	Leu	Pro	Val	Leu
2270						2275					2280			
Pro	Leu	Leu	Val	Ser	Gly	Arg	Thr	Ala	Pro	Ala	Leu	Arg	Ala	Gln
2285						2290					2295			
Ala	Glu	Arg	Leu	Arg	Pro	Ala	Ala	Thr	Ala	Leu	Ala	Thr	Gly	Thr
2300						2305					2310			
Val	Thr	Asn	Ser	Gly	Ala	Leu	Glu	Ala	Leu	Asp	Leu	Gly	Tyr	Ser
2315						2320					2325			
Leu	Ala	Thr	Ser	Arg	Ala	Ala	Leu	Glu	His	Arg	Ala	Val	Leu	Ile
2330						2335					2340			
Gly	Thr	Pro	Ser	Asp	Gly	Gln	Ala	Leu	Ala	Ser	Arg	Leu	Asp	Ala
2345						2350					2355			
Leu	Ala	Ala	Gly	Glu	Gln	Val	Pro	Gly	Leu	Val	Gln	Gly	Thr	Ala
2360						2365					2370			
Ser	Gly	Gly	Gly	Leu	Ala	Phe	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln
2375						2380					2385			
Arg	Leu	Gly	Met	Gly	Arg	Glu	Leu	Tyr	Glu	Thr	Tyr	Pro	Val	Phe
2390						2395					2400			
Ala	Glu	Ala	Leu	Asp	Ala	Val	Cys	Ala	Arg	Leu	Glu	Leu	Pro	Leu
2405						2410					2415			
Lys	Glu	Val	Leu	Phe	Gly	Ala	Asp	Gly	Ala	Ala	Leu	Asp	Gln	Thr
2420						2425					2430			
Ala	Val	Thr	Gln	Pro	Ala	Leu	Phe	Ala	Ile	Glu	Val	Ala	Leu	Phe
2435						2440					2445			
Arg	Leu	Val	Glu	Ser	Trp	Gly	Leu	Arg	Pro	Asp	Phe	Val	Ala	Gly
2450						2455					2460			

His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe
2465						2470					2475			
Ser	Leu	Glu	Asp	Ala	Cys	Arg	Leu	Val	Glu	Ala	Arg	Gly	Arg	Leu
2480						2485					2490			
Met	Gln	Ala	Leu	Pro	Gly	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala
2495						2500					2505			
Ser	Glu	Asp	Glu	Val	Leu	Pro	Leu	Leu	Thr	Asp	Arg	Val	Ser	Ile
2510						2515					2520			
Ala	Ala	Ile	Asn	Gly	Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu
2525						2530					2535			
Ala	Asp	Ala	Val	Ala	Ile	Ala	Glu	Ser	Phe	Thr	Gly	Arg	Lys	Ser
2540						2545					2550			
Lys	His	Leu	Ala	Val	Ser	His	Ala	Phe	His	Ser	Pro	His	Met	Asp
2555						2560					2565			
Gly	Met	Leu	Glu	Asp	Phe	Arg	Ala	Val	Ala	Glu	Gly	Leu	Ser	Tyr
2570						2575					2580			
Glu	Ala	Pro	Arg	Ile	Ala	Val	Val	Ser	Asn	Leu	Thr	Gly	Ala	Leu
2585						2590					2595			
Val	Ser	Asp	Glu	Met	Ser	Ser	Ala	Glu	Phe	Trp	Val	Arg	His	Val
2600						2605					2610			
Arg	Glu	Ala	Val	Arg	Phe	Leu	Asp	Gly	Ile	Arg	Ala	Leu	Glu	Ala
2615						2620					2625			
Ala	Gly	Val	Thr	Thr	Tyr	Val	Glu	Leu	Gly	Pro	Gly	Gly	Val	Leu
2630						2635					2640			
Ser	Ala	Leu	Ala	Gln	Glu	Cys	Val	Ser	Gly	Asp	Gly	Ala	Ala	Phe
2645						2650					2655			
Val	Pro	Val	Leu	Arg	Ser	Gly	Arg	Ser	Glu	Ala	Glu	Thr	Val	Val
2660						2665					2670			
Thr	Ala	Leu	Ala	Gln	Ala	His	Val	Arg	Gly	Val	Glu	Val	Asp	Trp
2675						2680					2685			
Ala	Ala	Phe	Phe	Ala	Gly	Thr	Gly	Ala	Glu	Arg	Ile	Asp	Leu	Pro
2690						2695					2700			
Thr	Tyr	Ala	Phe	Gln	Arg	Gln	Arg	Tyr	Trp	Pro	Glu	Thr	Val	Leu
2705						2710					2715			
Ser	Thr	Val	Gly	Pro	Val	Val	Ala	Glu	Ala	Val	Asp	Ala	Val	Asp
2720						2725					2730			
Ala	Arg	Phe	Trp	Asp	Ala	Val	Glu	Arg	Glu	Asp	Leu	Ala	Ser	Leu
2735						2740					2745			
Val	Ala	Glu	Leu	Asp	Val	Asp	Glu	Thr	Pro	Leu	Gly	Glu	Val	Val
2750						2755					2760			

Pro	Ala	Leu	Ser	Ala	Trp	Arg	Arg	Glu	Arg	Arg	Ala	Gln	Ser	Glu
2765						2770					2775			
Val	Asp	Gly	Trp	Arg	Tyr	Arg	Val	Ser	Trp	Lys	Pro	Leu	Ala	Asp
2780						2785					2790			
Ala	Ser	Thr	Ala	Arg	Leu	Ser	Gly	Ser	Trp	Val	Val	Val	Ser	Pro
2795						2800					2805			
Asp	Lys	Gly	Val	Asp	Asp	Ser	Ala	Val	Val	Ala	Gly	Leu	Ala	Gly
2810						2815					2820			
Arg	Gly	Ala	Glu	Val	Arg	Arg	Val	Val	Val	Glu	Ala	Gly	Val	Asp
2825						2830					2835			
Arg	Ser	Ala	Leu	Ala	Gly	Leu	Leu	Ala	Asp	Ala	Gly	Ser	Ala	Ala
2840						2845					2850			
Gly	Val	Val	Ser	Leu	Leu	Gly	Leu	Asp	Glu	Ser	Glu	Gly	Leu	Leu
2855						2860					2865			
Gly	Thr	Val	Gly	Leu	Val	Gln	Ala	Leu	Gly	Asp	Ala	Gly	Val	Glu
2870						2875					2880			
Ala	Pro	Leu	Trp	Cys	Leu	Thr	Arg	Gly	Ala	Val	Ser	Val	Gly	Arg
2885						2890					2895			
Ser	Asp	Arg	Leu	Val	Ser	Pro	Val	Gln	Ala	Gln	Val	Trp	Gly	Leu
2900						2905					2910			
Gly	Arg	Val	Ala	Ala	Leu	Glu	Val	Pro	Glu	His	Trp	Gly	Gly	Leu
2915						2920					2925			
Val	Asp	Leu	Pro	Glu	Val	Leu	Asp	Glu	Arg	Ala	Val	Ala	Arg	Leu
2930						2935					2940			
Val	Gly	Val	Leu	Ala	Gly	Ser	Gly	Glu	Asp	Gln	Val	Ala	Val	Arg
2945						2950					2955			
Ser	Ser	Gly	Val	Phe	Gly	Arg	Arg	Leu	Val	Arg	Ala	Pro	Arg	Ala
2960						2965					2970			
Glu	Gly	Ala	Ala	Ala	Trp	Thr	Pro	Thr	Gly	Thr	Val	Leu	Val	Thr
2975						2980					2985			
Gly	Gly	Thr	Gly	Val	Leu	Gly	Gly	Arg	Val	Ala	Arg	Trp	Leu	Ala
2990						2995					3000			
Gly	Ala	Gly	Ala	Glu	Arg	Leu	Val	Leu	Thr	Ser	Arg	Arg	Gly	Pro
3005						3010					3015			
Asp	Ala	Pro	Gly	Ala	Ala	Glu	Leu	Val	Glu	Glu	Leu	Thr	Thr	Gly
3020						3025					3030			
Phe	Gly	Val	Glu	Val	Ser	Ile	Val	Ala	Cys	Asp	Ala	Ala	Asp	Arg
3035						3040					3045			
Asp	Ala	Leu	Arg	Ala	Leu	Leu	Ser	Ala	Glu	Ala	Gly	Thr	Leu	Thr
3050						3055					3060			

Ala Val	Ile His Thr Ala	Gly Val	Leu Asp Asp Gly	Val Leu Asp
3065		3070	3075	
Ala Leu	Thr Pro Asp Arg Ile	Asp Ser Val Leu	Arg Ala Lys Ala	
3080		3085	3090	
Val Ser	Ala Leu Asn Leu His	Glu Leu Thr Ala	Glu Leu Asp Ile	
3095		3100	3105	
Glu Leu	Ser Ala Phe Val Leu	Phe Ser Ser Met Ser	Gly Thr Val	
3110		3115	3120	
Gly Ala	Ala Gly Gln Ala Asn	Tyr Ala Ala Ala Asn	Ala Phe Leu	
3125		3130	3135	
Asp Ala	Leu Ala Glu Gln Arg	Arg Ala Asp Gly Leu	Ala Ala Thr	
3140		3145	3150	
Ser Leu	Ala Trp Gly Pro Trp	Ala Glu Gly Gly Met	Ala Ala Asp	
3155		3160	3165	
Ala Ala	Leu Glu Ala Arg Met	Arg Arg Gly Gly Val	Pro Pro Met	
3170		3175	3180	
Asp Ala	Glu Leu Ala Leu Ser	Ala Leu Arg Gln Ala	Ile Gly Ser	
3185		3190	3195	
Ala Asp	Ala Ala Leu Thr Ile	Val Asp Phe Asp Trp	Ala Arg Phe	
3200		3205	3210	
Ala Pro	Gly Phe Thr Ala Val	Arg Ala Gly Asn Leu	Leu Ala Glu	
3215		3220	3225	
Leu Pro	Glu Ala Ala Ala Val	Met Arg Gly Pro Glu	Asn Ala Asp	
3230		3235	3240	
Ser Arg	Pro Glu His Ala Asp	Ser Ser Leu Ala Leu	Arg Leu Gln	
3245		3250	3255	
Gly Met	Ala Gln Ala Asp Gln	Glu Pro Phe Leu Leu	Glu Leu Val	
3260		3265	3270	
Arg Ala	Gln Val Ala Glu Val	Leu Gly His Ser Gly	Ala Glu Asp	
3275		3280	3285	
Ile Glu	Ala Gly Arg Ala Phe	Arg Glu Ile Gly Phe	Asp Ser Leu	
3290		3295	3300	
Thr Ala	Val Glu Leu Arg Asn	Arg Leu Gly Ala Ala	Ala Glu Leu	
3305		3310	3315	
Arg Leu	Pro Ala Thr Leu Val	Tyr Asp Tyr Pro Thr	Pro Ala Ala	
3320		3325	3330	
Leu Ala	Val His Leu Arg Thr	Glu Leu Leu Gly Lys	Gln Val Val	
3335		3340	3345	
Val Ser	Gly Pro Val Ser Lys	Val Val Asp Asp Asp	Pro Ile Ala	
3350		3355	3360	





Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Thr	Leu	Gly	Asp	Pro	Ile	Glu
3665						3670					3675			
Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	Pro	Ala	Asp
3680						3685					3690			
Arg	Pro	Leu	Gln	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Ile	Gly	His	Thr
3695						3700					3705			
Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile	Lys	Met	Val	Leu	Ala
3710						3715					3720			
Met	Glu	His	Gly	Val	Leu	Pro	Gln	Ser	Leu	His	Ile	Asp	Ala	Pro
3725						3730					3735			
Ser	Pro	Gln	Val	Asp	Trp	Glu	Ala	Gly	Asp	Ile	Ala	Leu	Leu	Thr
3740						3745					3750			
Glu	Gln	Arg	Gln	Trp	Pro	Glu	Thr	Gly	Arg	Pro	Arg	Arg	Ala	Gly
3755						3760					3765			
Val	Ser	Ser	Phe	Gly	Phe	Ser	Gly	Thr	Asn	Ala	His	Thr	Ile	Ile
3770						3775					3780			
Glu	Gln	Ala	Pro	Ala	Ser	Thr	Glu	Thr	Asp	Arg	Ala	Glu	Ser	Gly
3785						3790					3795			
Ser	Val	Glu	Pro	Asp	Phe	Val	Pro	Leu	Met	Leu	Ser	Ala	Lys	Ser
3800						3805					3810			
Asp	Val	Ala	Leu	Arg	Ala	Gln	Ala	Ala	Ser	Leu	Arg	Ala	Arg	Leu
3815						3820					3825			
Ile	Ala	Ala	Pro	Asp	Met	Arg	Leu	Ser	Asp	Val	Gly	Ser	Thr	Leu
3830						3835					3840			
Thr	Thr	Gly	Arg	Ser	Ala	Phe	Glu	Arg	Arg	Ala	Ala	Leu	Val	Ala
3845						3850					3855			
Gly	Gly	Arg	Glu	Gly	Leu	Leu	Ala	Gly	Leu	Glu	Ala	Leu	Ala	Asp
3860						3865					3870			
Gly	Gly	Ser	Ala	Ala	Gly	Leu	Val	Glu	Gly	Ser	Pro	Val	Ser	Gly
3875						3880					3885			
Lys	Leu	Ala	Phe	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln	Arg	Leu	Gly
3890						3895					3900			
Met	Gly	Arg	Glu	Leu	Tyr	Glu	Ala	Tyr	Pro	Val	Phe	Ala	Asp	Ala
3905						3910					3915			
Leu	Asp	Ala	Val	Cys	Val	Arg	Leu	Glu	Leu	Pro	Leu	Met	Asp	Val
3920						3925					3930			
Leu	Phe	Gly	Ala	Asp	Ala	Gly	Leu	Leu	Asn	Glu	Thr	Ala	Tyr	Thr
3935						3940					3945			
Gln	Pro	Ala	Leu	Phe	Ala	Val	Glu	Val	Ala	Leu	Phe	Arg	Leu	Val
3950						3955					3960			

Glu	Ser	Trp	Gly	Leu	Arg	Pro	Asp	Phe	Leu	Ala	Gly	His	Ser	Ile
3965						3970					3975			
Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Leu	Ser	Leu	Asp
3980						3985					3990			
Asp	Ala	Cys	Ala	Leu	Val	Glu	Ala	Arg	Gly	Arg	Leu	Met	Gly	Ala
3995						4000					4005			
Leu	Pro	Ala	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala	Ser	Glu	Asp
4010						4015					4020			
Glu	Val	Leu	Pro	Leu	Leu	Thr	Asp	Arg	Val	Ser	Ile	Ala	Ala	Ile
4025						4030					4035			
Asn	Gly	Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu	Ala	Asp	Ala
4040						4045					4050			
Val	Ala	Ile	Val	Glu	Ser	Phe	Thr	Gly	Arg	Lys	Ser	Lys	Arg	Leu
4055						4060					4065			
Ser	Val	Ser	His	Ala	Phe	His	Ser	Pro	His	Met	Asp	Gly	Met	Leu
4070						4075					4080			
Glu	Asp	Phe	Arg	Val	Val	Ala	Glu	Gly	Leu	Ser	Tyr	Asp	Ala	Pro
4085						4090					4095			
Arg	Ile	Pro	Val	Val	Ser	Asn	Leu	Thr	Gly	Ala	Leu	Val	Thr	Asp
4100						4105					4110			
Glu	Met	Gly	Ser	Ala	Asp	Phe	Trp	Val	Arg	His	Val	Arg	Glu	Ala
4115						4120					4125			
Val	Arg	Phe	Leu	Asp	Gly	Ile	Arg	Ala	Leu	Glu	Ala	Ala	Gly	Val
4130						4135					4140			
Thr	Thr	Tyr	Val	Glu	Leu	Gly	Pro	Asp	Gly	Val	Leu	Ser	Ala	Met
4145						4150					4155			
Ala	Gln	Glu	Cys	Val	Thr	Glu	Gly	Gly	Ala	Ala	Phe	Val	Pro	Val
4160						4165					4170			
Leu	Arg	Lys	Gly	Arg	Pro	Glu	Ala	Glu	Thr	Val	Met	Ala	Thr	Leu
4175						4180					4185			
Gly	Gln	Ala	His	Val	Arg	Gly	Val	Ala	Val	Asp	Trp	His	Ser	Val
4190						4195					4200			
Tyr	Gly	Thr	Gly	Ala	Gln	Arg	Val	Asp	Leu	Pro	Thr	Tyr	Ser	Phe
4205						4210					4215			
Gln	Arg	Gln	Arg	Tyr	Trp	Pro	Ala	Ala	Ser	Ser	Thr	Ala	Gly	Gly
4220						4225					4230			
Ser	Val	Asp	Arg	Ser	Val	Asp	Ala	Val	Asp	Ala	Arg	Phe	Trp	Asp
4235						4240					4245			
Ala	Val	Glu	Arg	Glu	Asp	Leu	Ala	Ser	Leu	Ala	Ala	Glu	Leu	Asp
4250						4255					4260			

Leu	Asp	Asp	Asp	Ala	Pro	Phe	Ser	Glu	Leu	Ala	Pro	Ala	Leu	Ser
4265						4270					4275			
Ala	Trp	Arg	Arg	Glu	Arg	Arg	Ala	Leu	Ser	Glu	Val	Asp	Gly	Trp
4280						4285					4290			
Arg	Tyr	Arg	Val	Ser	Trp	Lys	Pro	Leu	Ala	Asp	Val	Ser	Ala	Ser
4295						4300					4305			
Gly	Leu	Ser	Gly	Ser	Trp	Val	Val	Ile	Ser	Pro	Ala	Gly	Gly	Val
4310						4315					4320			
Asp	Asp	Ser	Ala	Val	Val	Gly	Ala	Leu	Val	Gly	Arg	Gly	Ala	Glu
4325						4330					4335			
Val	Arg	Arg	Val	Val	Val	Glu	Ala	Gly	Val	Asp	Arg	Ser	Ala	Leu
4340						4345					4350			
Ala	Gly	Leu	Leu	Ala	Asp	Ala	Gly	Ser	Ala	Ala	Gly	Val	Val	Ser
4355						4360					4365			
Leu	Leu	Gly	Leu	Asp	Glu	Ser	Glu	Gly	Leu	Leu	Gly	Thr	Val	Gly
4370						4375					4380			
Leu	Val	Gln	Ala	Leu	Gly	Asp	Ala	Gly	Val	Glu	Ala	Pro	Leu	Trp
4385						4390					4395			
Cys	Leu	Thr	Arg	Gly	Ala	Val	Ser	Val	Gly	Arg	Ser	Asp	Arg	Leu
4400						4405					4410			
Val	Ser	Pro	Val	Gln	Ala	Gln	Val	Trp	Gly	Leu	Gly	Arg	Val	Ala
4415						4420					4425			
Ala	Leu	Glu	Val	Pro	Glu	Arg	Trp	Gly	Gly	Leu	Ile	Asp	Leu	Pro
4430						4435					4440			
Glu	Val	Leu	Asp	Glu	Arg	Ala	Val	Ser	Arg	Leu	Val	Gly	Val	Leu
4445						4450					4455			
Ser	Gly	Gly	Gly	Ser	Gly	Glu	Asp	Gln	Val	Ala	Val	Arg	Ser	Ser
4460						4465					4470			
Gly	Val	Phe	Gly	Arg	Arg	Leu	Val	Arg	Ala	Pro	Arg	Ala	Glu	Gly
4475						4480					4485			
Ala	Ser	Ala	Trp	Ser	Pro	Thr	Gly	Thr	Val	Leu	Val	Thr	Gly	Gly
4490						4495					4500			
Thr	Gly	Val	Leu	Gly	Gly	Arg	Val	Ala	Arg	Trp	Leu	Ala	Gly	Ala
4505						4510					4515			
Gly	Ala	Glu	Arg	Leu	Val	Leu	Thr	Ser	Arg	Arg	Gly	Pro	Asp	Ala
4520						4525					4530			
Pro	Gly	Ala	Ala	Glu	Leu	Val	Glu	Glu	Leu	Ala	Gly	Ser	Gly	Val
4535						4540					4545			
Glu	Val	Ser	Val	Val	Ala	Cys	Asp	Ala	Ala	Asp	Arg	Asp	Ala	Leu
4550						4555					4560			

Arg	Ala	Leu	Leu	Ser	Ala	Glu	Ala	Gly	Thr	Leu	Thr	Ala	Val	Ile
4565						4570					4575			
His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	Val	Leu	Asp	Ala	Leu	Thr
4580						4585					4590			
Pro	Asp	Arg	Ile	Asp	Ser	Val	Leu	Arg	Ala	Lys	Ala	Val	Ser	Ala
4595						4600					4605			
Ile	Asn	Leu	His	Glu	Leu	Thr	Ala	Glu	Leu	Gly	Ile	Glu	Leu	Ser
4610						4615					4620			
Ala	Phe	Val	Leu	Phe	Ser	Ser	Val	Thr	Gly	Thr	Trp	Gly	Thr	Ala
4625						4630					4635			
Gly	Gln	Ala	Asn	Tyr	Ala	Ala	Ala	Asn	Ala	Tyr	Leu	Asp	Ala	Leu
4640						4645					4650			
Ala	Glu	Gln	Arg	Arg	Ala	Asp	Gly	Leu	Ala	Ala	Thr	Ser	Ile	Ala
4655						4660					4665			
Trp	Gly	Pro	Trp	Ala	Glu	Gly	Gly	Met	Ala	Ala	Asp	Ala	Ala	Leu
4670						4675					4680			
Glu	Ala	Arg	Met	Arg	Arg	Gly	Gly	Val	Pro	Pro	Met	Lys	Gly	Glu
4685						4690					4695			
Ala	Ala	Val	Asn	Ala	Leu	Gln	Arg	Ala	Leu	Asn	Ala	Asn	Asp	Thr
4700						4705					4710			
Val	Val	Thr	Val	Val	Asp	Val	Glu	Trp	Glu	Arg	Phe	Ala	Pro	Gly
4715						4720					4725			
Phe	Thr	Ala	Ala	Arg	Ala	Ser	Thr	Leu	Leu	Ala	Glu	Leu	Pro	Glu
4730						4735					4740			
Ala	Gln	Arg	Ala	Leu	Ala	Pro	Gln	Glu	Gly	Asp	Glu	Gly	Gln	Asp
4745						4750					4755			
Asp	Gly	Ala	Val	His	Gly	Arg	Gly	Gly	His	Ser	Leu	Ala	Glu	Arg
4760						4765					4770			
Leu	Ala	Glu	Leu	Ser	Ala	Ala	Glu	Arg	Asp	Arg	Leu	Leu	Leu	Gly
4775						4780					4785			
Leu	Val	Arg	Lys	Glu	Val	Ala	Ala	Val	Leu	Gly	His	Ala	Gly	Val
4790						4795					4800			
Glu	Ser	Ile	Gly	Ala	Ala	Arg	Ala	Phe	Lys	Glu	Leu	Gly	Phe	Asp
4805						4810					4815			
Ser	Leu	Thr	Ala	Val	Glu	Leu	Arg	Asn	Arg	Leu	Gly	Ala	Val	Thr
4820						4825					4830			
Gly	Leu	Arg	Leu	Pro	Ala	Thr	Leu	Ile	Tyr	Asp	Tyr	Pro	Thr	Ser
4835						4840					4845			
Gly	Ala	Leu	Ala	Glu	Tyr	Leu	Arg	Gly	Glu	Leu	Leu	Gly	Thr	Gln
4850						4855					4860			

Ala Val Val Ser Gly Pro Val Ser Asn Ala Val Ala Val Asp Asp	4865	4870	4875
Asp Pro Ile Ala Ile Val Ala Met Ser Cys Arg Phe Pro Gly Gly	4880	4885	4890
Val Arg Thr Pro Glu Asp Leu Trp Gln Leu Leu Ala Thr Gly Arg	4895	4900	4905
Asp Ala Ile Gly Glu Phe Pro Glu Asp Arg Gly Trp Asp Ala Glu	4910	4915	4920
Ala Leu Phe Gly Pro Gln Phe Glu Gln Asp Ala Pro Tyr Ala Arg	4925	4930	4935
Glu Gly Gly Phe Leu Tyr Asp Val Ala Asp Phe Asp Pro Ala Phe	4940	4945	4950
Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln	4955	4960	4965
Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Phe Glu Arg Ala Gly	4970	4975	4980
Ile Asp Pro Leu Ser Val Arg Gly Ser Gln Ala Gly Val Phe Val	4985	4990	4995
Gly Thr Asn Gly Gln Asp Tyr Leu Ser Leu Val Leu Asn Ser Ala	5000	5005	5010
Asp Gly Gly Asp Gly Phe Met Ser Thr Gly Asn Ser Ala Ser Val	5015	5020	5025
Val Ser Gly Arg Leu Ser Tyr Val Phe Gly Leu Glu Gly Pro Ala	5030	5035	5040
Val Thr Val Asp Thr Ala Cys Ser Ala Ser Leu Val Ala Leu His	5045	5050	5055
Leu Ala Val Gln Ala Leu Arg Asn Gly Glu Cys Ser Leu Ala Leu	5060	5065	5070
Ala Gly Gly Val Thr Val Met Ser Thr Pro Gly Ala Phe Ala Glu	5075	5080	5085
Phe Ser Arg Gln Arg Gly Leu Ala Glu Asp Gly Arg Ile Lys Ala	5090	5095	5100
Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Gly Glu Gly Val Gly	5105	5110	5115
Met Leu Leu Val Glu Arg Leu Ser Asp Ala Arg Arg Asn Gly His	5120	5125	5130
Pro Val Leu Ala Leu Val Arg Gly Ser Ala Val Asn Gln Asp Gly	5135	5140	5145
Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg	5150	5155	5160

Val	Ile	Arg	Ala	Ala	Leu	Ala	Ser	Ala	Gly	Leu	Ala	Pro	Gly	Asp	
5165						5170					5175				
Ile	Asp	Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Lys	Leu	Gly	Asp	
5180						5185					5190				
Pro	Ile	Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	
5195						5200					5205				
Pro	Ala	Asp	Arg	Pro	Leu	Gln	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Ile	
5210						5215					5220				
Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Leu	Met	Lys	Met	
5225						5230					5235				
Val	Leu	Ala	Met	Gln	His	Gly	Val	Leu	Pro	Gln	Thr	Leu	His	Val	
5240						5245					5250				
Asp	Glu	Pro	Thr	Pro	His	Val	Asp	Trp	Ser	Ala	Gly	Asp	Ile	Ala	
5255						5260					5265				
Leu	Leu	Thr	Glu	Arg	Arg	Glu	Trp	Pro	Glu	Thr	Gly	Arg	Pro	Arg	
5270						5275					5280				
Arg	Ala	Gly	Ile	Ser	Ser	Phe	Gly	Val	Ser	Gly	Thr	Asn	Ala	His	
5285						5290					5295				
Thr	Ile	Leu	Glu	Gln	Ala	Pro	Pro	Leu	Thr	Glu	Lys	Asp	Glu	Ala	
5300						5305					5310				
Glu	Ala	Ala	Arg	Pro	Glu	Thr	Gly	Ser	Ala	Val	Ser	Ala	Trp	Pro	
5315						5320					5325				
Leu	Ala	Gly	Lys	Thr	Glu	Ala	Gly	Leu	Arg	Glu	Gln	Ala	Glu	Arg	
5330						5335					5340				
Leu	Leu	Ala	His	Ile	Asp	Ala	His	Ser	Glu	Leu	Arg	Pro	Val	Asp	
5345						5350					5355				
Val	Gly	His	Ser	Leu	Ala	Thr	Gly	Arg	Ala	Ala	Phe	Asp	His	Arg	
5360						5365					5370				
Ala	Val	Leu	Val	Ala	Gly	Asp	Asp	Arg	Ser	Glu	Phe	Arg	Arg	Ala	
5375						5380					5385				
Leu	Ala	Ala	Leu	Ala	Ser	Gly	Glu	Ser	Val	Ala	Gln	Val	Val	Gln	
5390						5395					5400				
Gly	Ile	Ala	Arg	Pro	Asp	Gln	Gln	Val	Ala	Phe	Leu	Phe	Thr	Gly	
5405						5410					5415				
Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met	Gly	Arg	Glu	Leu	Tyr	Glu	Thr	
5420						5425					5430				
Tyr	Pro	Val	Phe	Ala	Asp	Ala	Leu	Asp	Ala	Val	Cys	Ala	Arg	Leu	
5435						5440					5445				
Glu	Leu	Pro	Leu	Lys	Asp	Val	Leu	Phe	Gly	Gly	Asp	Ala	Asp	Arg	
5450						5455					5460				

Leu	Asn	Glu	Thr	Ala	Tyr	Thr	Gln	Pro	Ala	Leu	Phe	Ala	Val	Glu
5465						5470					5475			
Val	Ala	Leu	Phe	Arg	Leu	Val	Glu	Ser	Trp	Gly	Val	Arg	Pro	Asp
5480						5485					5490			
Phe	Leu	Ala	Gly	His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val
5495						5500					5505			
Ala	Gly	Val	Phe	Ser	Leu	Asp	Asp	Ala	Cys	Ala	Leu	Val	Glu	Ala
5510						5515					5520			
Arg	Gly	Arg	Leu	Met	Gln	Ala	Leu	Pro	Thr	Gly	Gly	Val	Met	Ile
5525						5530					5535			
Ala	Val	Gln	Ala	Ser	Glu	Ala	Glu	Val	Leu	Pro	Leu	Leu	Thr	Glu
5540						5545					5550			
Arg	Val	Ser	Ile	Ala	Ala	Ile	Asn	Gly	Pro	Gln	Ser	Val	Val	Ile
5555						5560					5565			
Ala	Gly	Asp	Glu	Ala	Asp	Ala	Val	Ala	Ile	Val	Asp	Ala	Phe	Asn
5570						5575					5580			
Asp	Arg	Lys	Ser	Lys	Arg	Leu	Ala	Val	Ser	His	Ala	Phe	His	Ser
5585						5590					5595			
Pro	His	Met	Asp	Gly	Met	Leu	Ala	Asp	Phe	Arg	Lys	Val	Ala	Glu
5600						5605					5610			
Glu	Leu	Ser	Tyr	Glu	Ala	Pro	Arg	Ile	Pro	Ile	Val	Ser	Asn	Leu
5615						5620					5625			
Thr	Gly	Ala	Leu	Val	Thr	Asp	Glu	Met	Gly	Ser	Ala	Asp	Phe	Trp
5630						5635					5640			
Val	Arg	His	Val	Arg	Glu	Ala	Val	Arg	Phe	Leu	Asp	Gly	Ile	Arg
5645						5650					5655			
Ala	Leu	Glu	Ala	Ala	Gly	Val	Thr	Val	Tyr	Val	Glu	Leu	Gly	Pro
5660						5665					5670			
Asp	Gly	Val	Leu	Ser	Ala	Met	Ala	Gln	Glu	Cys	Val	Thr	Gly	Glu
5675						5680					5685			
Gly	Ala	Ala	Phe	Val	Pro	Ala	Leu	Arg	Lys	Gly	Arg	Pro	Glu	Ala
5690						5695					5700			
Glu	Thr	Ile	Thr	Ala	Ala	Leu	Ala	His	Ala	His	Thr	His	Gly	Ile
5705						5710					5715			
Ala	Val	Asp	Trp	Gln	Ala	Tyr	Phe	Ala	Gly	Thr	Gly	Ala	Gln	Arg
5720						5725					5730			
Val	Asp	Leu	Pro	Thr	Tyr	Ala	Phe	Gln	Arg	Gln	Arg	Tyr	Trp	Val
5735						5740					5745			
Asp	Ser	Phe	Ala	Glu	Phe	Asp	Asp	Val	Ala	Ser	Ala	Gly	Ile	Gly
5750						5755					5760			



Ser	Ala	Gly	His	Pro	Leu	Leu	Gly	Ala	Ala	Val	Glu	Leu	Pro	Asp
5765						5770					5775			
Ser	Asp	Gly	Phe	Leu	Phe	Thr	Gly	Arg	Leu	Ser	Leu	Arg	Thr	His
5780						5785					5790			
Pro	Trp	Leu	Ala	Asp	His	Val	Val	Ala	Asp	Thr	Val	Val	Val	Pro
5795						5800					5805			
Gly	Ala	Ala	Phe	Val	Glu	Leu	Ala	Val	Arg	Ala	Gly	Asp	Glu	Val
5810						5815					5820			
Gly	Cys	Glu	Glu	Val	Glu	Glu	Leu	Val	Leu	Glu	Ala	Pro	Leu	Val
5825						5830					5835			
Leu	Pro	Glu	Lys	Gly	Ala	Val	Gln	Leu	Arg	Leu	Ser	Val	Gly	Gly
5840						5845					5850			
Ala	Asp	Asp	Gln	Gly	Arg	Arg	Ser	Val	His	Val	His	Ser	Arg	Val
5855						5860					5865			
Glu	Ala	Ala	Asp	Gly	Gly	Gly	Val	Pro	Gly	Gly	Ala	Trp	Ser	Arg
5870						5875					5880			
Asn	Ala	Thr	Gly	Leu	Leu	Ser	Thr	Gly	Gly	Ser	Gly	Ser	Asp	Val
5885						5890					5895			
Asp	Ser	Gly	Thr	Val	Ile	Gly	Glu	Trp	Pro	Pro	Ala	Gly	Ala	Glu
5900						5905					5910			
Gln	Val	Asp	Val	Thr	Ala	Val	Arg	Glu	Arg	Leu	Ala	Ala	Ala	Gly
5915						5920					5925			
Leu	His	His	Gly	Pro	Gly	Phe	Arg	Thr	Leu	Thr	Glu	Val	Trp	Val
5930						5935					5940			
Arg	Gly	Glu	Glu	Val	Phe	Ala	Glu	Ala	Arg	Leu	Ser	Asp	Glu	Leu
5945						5950					5955			
Ser	Ala	Ser	Ala	Gly	Arg	Phe	Ala	Leu	His	Pro	Thr	Leu	Leu	Asp
5960						5965					5970			
Ala	Ala	Ser	Gln	Ala	Leu	Ala	Ala	Gly	Thr	Thr	Ala	Ala	Ala	Ser
5975						5980					5985			
Gly	Ile	Gly	Gly	Ala	Gly	Arg	Leu	Pro	Gln	Ala	Trp	Arg	Gly	Val
5990						5995					6000			
Arg	Leu	His	Ala	Gly	Gly	Ala	Asp	Ala	Leu	Arg	Leu	Arg	Ile	Thr
6005						6010					6015			
Ala	Gly	Gly	Gln	Asp	Thr	Val	Ser	Val	Val	Leu	Thr	Asp	Thr	Gln
6020						6025					6030			
Gly	Ala	Pro	Val	Ala	Thr	Val	Gly	Ser	Leu	Val	Thr	Glu	Ala	Val
6035						6040					6045			
Asp	Ala	Glu	Arg	Tyr	Ala	Ala	Val	Pro	Asp	Gly	Ser	His	Asp	Ser
6050						6055					6060			

Leu	Phe	Arg	Leu	Asp	Trp	Val	Arg	Thr	Thr	Ala	Pro	Gly	Arg	Pro
6065						6070					6075			
Thr	Ser	Ala	Asp	Phe	Ala	Val	Leu	Gly	Thr	Pro	Gly	Thr	Gly	Ile
6080						6085					6090			
Gly	Ala	Arg	Ile	Gly	Gly	Asp	Glu	Gly	Phe	Leu	Val	Gly	Ala	Leu
6095						6100					6105			
Glu	Arg	Ala	Gly	Leu	Thr	Ala	Glu	Thr	Tyr	Asp	Gly	Leu	Ala	Ala
6110						6115					6120			
Leu	Asp	Ser	Ala	Val	Ala	Ala	Gly	Met	Ala	Met	Pro	Glu	Thr	Val
6125						6130					6135			
Val	Val	Ser	Phe	Ala	Ala	Ala	Leu	Asp	Pro	Ala	Ser	Asp	Ser	Ala
6140						6145					6150			
Ala	Asp	Thr	Val	Ala	Ser	Val	Asp	Ser	Ala	Glu	Glu	Val	Ala	Arg
6155						6160					6165			
Leu	Ala	Gln	Ala	Val	Arg	Glu	Ala	Thr	His	Arg	Ala	Leu	Ala	Thr
6170						6175					6180			
Val	Gln	Gly	Trp	Leu	Asp	Asn	Gly	Arg	Phe	Ala	Gly	Ala	Arg	Leu
6185						6190					6195			
Val	Val	Val	Thr	Arg	Gly	Ala	Val	Ala	Thr	Gly	Arg	Asp	Thr	Glu
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 Lys Thr Lys Lys Leu Thr Val Ser His Ala Phe His Ser Pro His Met  
 755 760 765  
 Asp Gly Met Leu Asp Ala Phe Arg Thr Val Ala Gln Gly Leu Ser Tyr  
 770 775 780  
 Gly Thr Pro Arg Ile Pro Val Val Ser Asn Leu Thr Gly Ala Leu Val  
 785 790 795 800  
 Thr Asp Glu Met Gly Ser Ala Asp Phe Trp Val Arg His Val Arg Glu  
 805 810 815  
 Ala Val Arg Phe Leu Asp Gly Ile Arg Trp Leu Glu Ser Arg Gly Val  
 820 825 830  
 Thr Thr Tyr Ile Glu Leu Gly Pro Gly Gly Val Leu Ser Ala Leu Gly  
 835 840 845  
 Gln Asp Cys Gln Thr Ala Thr Gly Pro Arg Ala Ala Ala Phe Leu Pro  
 850 855 860  
 Ala Leu Arg Thr Gly Arg Pro Glu Ala Ser Ser Leu Thr Ala Ala Val  
 865 870 875 880  
 Ala Gly Ala His Val Arg Gly Leu Ser Pro Asp Trp Thr Val Arg Phe  
 885 890 895  
 Ala Gly Thr Gly Ala Gln Arg Val Glu Leu Pro Thr Tyr Ala Phe Gln  
 900 905 910

Arg Glu Leu Tyr Trp Pro Arg Asp Pro Phe Thr Asp Pro Ala Glu Ser  
 915 920 925  
 Ala His Gly Gly Glu Leu Gly Ala Thr Asp Ala Lys Phe Trp Glu Val  
 930 935 940  
 Val Asp Ser Glu Asp Leu Ala Ala Leu Ala Asp Thr Leu Gly Val Gly  
 945 950 955 960  
 Gly Asp Glu Pro Leu Ser Ser Val Leu Pro Ala Leu Ser Ala Trp His  
 965 970 975  
 Arg Arg His Arg Asp Arg Asp Thr Val Asp Gly Trp Arg Tyr Arg Val  
 980 985 990  
 Thr Trp Lys Pro Leu Thr Asp Thr Thr Pro Ala Ser Pro Ser Gly His  
 995 1000 1005  
 Trp Leu Leu Val Val Pro Thr Glu His Ala Asp Ala Pro Trp Ala  
 1010 1015 1020  
 Val Ala Ala Glu Arg Ala Leu Thr Ala Arg Gly Val Thr Val Ser  
 1025 1030 1035  
 Thr Val Val Leu Asp Ala Thr Leu Asp Asp Arg Ala Ala Thr Ala  
 1040 1045 1050  
 Arg Arg Ile Gly Glu Ala Leu Ala Ala Ser Ala Ala Thr Asp Ser  
 1055 1060 1065  
 Ala Pro Ala Gly Ala Glu Thr Leu Ala Gly Val Phe Ser Leu Leu  
 1070 1075 1080  
 Ala Leu Glu Glu Arg Pro His Pro Ala Asp Pro Ala Leu Ser Ala  
 1085 1090 1095  
 Gly Leu Ala Ala Thr Val Ala Leu Ile Gln Ala Leu Gly Asp Ala  
 1100 1105 1110  
 Gly Val Glu Ala Pro Leu Trp Ala Ala Thr Cys Gly Ala Val Ser  
 1115 1120 1125  
 Thr Gly Arg Thr Asp Arg Leu Ser Ser Thr Ala Gln Ala Gln Val  
 1130 1135 1140  
 Trp Gly Leu Gly Arg Thr Ala Ala Leu Glu Leu Pro Val Arg Trp  
 1145 1150 1155  
 Gly Gly Leu Val Asp Leu Pro Gly Thr Pro Asp Glu Arg Ala Ala  
 1160 1165 1170  
 Gly Arg Leu Ala Asp Val Leu Gly Gly Leu Gly Gly Pro Gly Ala  
 1175 1180 1185  
 Glu Asp His Leu Ala Val Arg Ser Thr Gly Val Phe Val Arg Arg  
 1190 1195 1200  
 Leu Ala Arg Ala Thr Arg Asp Glu Arg Pro Thr Thr Glu Trp Ala  
 1205 1210 1215

Thr	Thr	Gly	Thr	Ala	Leu	Ile	Thr	Gly	Gly	Thr	Gly	Ala	Leu	Gly
1220						1225					1230			
Arg	His	Val	Ala	Arg	Trp	Leu	Ala	Arg	Thr	Gly	Ala	Gln	His	Leu
1235						1240					1245			
Leu	Leu	Val	Ser	Arg	Arg	Gly	Pro	Glu	Ala	Glu	Gly	Ala	Asp	Ala
1250						1255					1260			
Leu	Ala	Ala	Glu	Leu	Arg	Ala	Leu	Gly	Ala	Glu	Val	Thr	Ile	Ala
1265						1270					1275			
Ala	Cys	Asp	Val	Ala	Asp	Arg	Asp	Ala	Val	Ala	Ala	Leu	Leu	Ala
1280						1285					1290			
Thr	Leu	Pro	Ala	Glu	His	Pro	Leu	Thr	Asn	Val	Val	His	Ala	Ala
1295						1300					1305			
Gly	Val	Leu	Asp	Asp	Gly	Val	Leu	Asp	Ala	Gln	Thr	Pro	Gln	Arg
1310						1315					1320			
Leu	Ala	Gly	Val	Leu	Arg	Pro	Lys	Ala	His	Ala	Ala	Gln	Val	Leu
1325						1330					1335			
His	Glu	Leu	Thr	Arg	Asp	Leu	Asp	Leu	Ser	Ala	Phe	Val	Leu	Phe
1340						1345					1350			
Ser	Ser	Val	Ala	Ala	Val	Phe	Gly	Ala	Ala	Gly	Gln	Ala	Asn	Tyr
1355						1360					1365			
Ala	Ala	Ala	Asn	Ala	Ser	Leu	Glu	Ala	Leu	Ala	Glu	Gln	Arg	Arg
1370						1375					1380			
Ala	Asp	Gly	Leu	Pro	Ala	Thr	Val	Leu	Ala	Trp	Gly	Ala	Trp	Ala
1385						1390					1395			
Glu	Gly	Gly	Met	Ala	Thr	Asp	Glu	Leu	Val	Ala	Glu	Arg	Leu	Arg
1400						1405					1410			
Leu	Ala	Gly	Leu	Pro	Ala	Leu	Ala	Pro	Glu	Leu	Ala	Leu	Ser	Ala
1415						1420					1425			
Leu	His	Arg	Ala	Leu	Thr	Leu	Asp	Glu	Thr	Ala	Ser	Leu	Val	Ala
1430						1435					1440			
Asp	Ile	Asp	Trp	Glu	Arg	Leu	Ala	Pro	Gly	Leu	Thr	Ala	Val	Arg
1445						1450					1455			
Pro	Cys	Pro	Leu	Ile	Ala	Asp	Leu	Pro	Glu	Ala	Val	His	Ala	Leu
1460						1465					1470			
Ala	Gly	Ala	Glu	Ala	Ser	Thr	Gly	Pro	Gly	Ala	Ala	Ala	Asp	Thr
1475						1480					1485			
Phe	Ala	Arg	Gln	Leu	Ala	Asp	Ala	Pro	Ala	Gly	Glu	Arg	Asp	Gln
1490						1495					1500			
Leu	Ala	Leu	Glu	Phe	Val	Arg	Thr	Gln	Val	Ala	Ala	Val	Leu	Gly
1505						1510					1515			

Tyr	Ala	Gly	Pro	Glu	Ser	Val	Asp	Pro	Gly	Ser	Ala	Phe	Arg	Asp	
1520						1525					1530				
Leu	Gly	Phe	Asp	Ser	Leu	Thr	Ala	Val	Glu	Ile	Arg	Asn	Leu	Leu	
1535						1540					1545				
Thr	Ser	Arg	Thr	Gly	Leu	Arg	Leu	Pro	Ala	Thr	Leu	Ile	Phe	Asp	
1550						1555					1560				
Tyr	Pro	Asn	Ser	Leu	Ser	Leu	Ala	Ala	Phe	Leu	Gln	Gly	Glu	Leu	
1565						1570					1575				
Leu	Gly	Ala	Gln	Ala	Thr	Asp	Pro	Ala	Arg	His	Thr	Pro	Ala	Gly	
1580						1585					1590				
Pro	Gly	Thr	Ala	Thr	Asp	Asp	Asp	Pro	Ile	Ala	Ile	Val	Ala	Met	
1595						1600					1605				
Ser	Cys	Arg	Phe	Pro	Gly	Gly	Val	Gln	Ser	Pro	Glu	Asp	Leu	Trp	
1610						1615					1620				
Gln	Leu	Leu	Ser	Thr	Gly	Arg	Asp	Ala	Ile	Ser	Gly	Phe	Pro	Gly	
1625						1630					1635				
Asp	Arg	Gly	Trp	Asp	Leu	Asp	Gly	Leu	Tyr	Asp	Pro	Glu	Ser	Ala	
1640						1645					1650				
Gly	Glu	Asn	Thr	Ser	Tyr	Val	Arg	Glu	Gly	Gly	Phe	Leu	Ala	Gly	
1655						1660					1665				
Ala	Thr	Glu	Phe	Asp	Pro	Ala	Phe	Phe	Gly	Ile	Ser	Pro	Arg	Glu	
1670						1675					1680				
Ala	Leu	Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Leu	Leu	Glu	Thr	Ser	
1685						1690					1695				
Trp	Glu	Ala	Phe	Glu	Arg	Ala	Gly	Ile	Asp	Pro	Ala	Thr	Val	Arg	
1700						1705					1710				
Gly	Glu	Gln	Ile	Gly	Val	Phe	Thr	Gly	Thr	Asn	Gly	Gln	Asp	Tyr	
1715						1720					1725				
Leu	Asn	Val	Ile	Leu	Ala	Ala	Pro	Asp	Gly	Val	Glu	Gly	Phe	Leu	
1730						1735					1740				
Gly	Thr	Gly	Asn	Ala	Ala	Ser	Val	Val	Ser	Gly	Arg	Val	Ser	Tyr	
1745						1750					1755				
Val	Leu	Gly	Leu	Glu	Gly	Pro	Ala	Val	Thr	Val	Asp	Thr	Ala	Cys	
1760						1765					1770				
Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Trp	Ala	Ile	Gln	Ala	Leu	Arg	
1775						1780					1785				
Gln	Gly	Glu	Cys	Thr	Met	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val	Met	
1790						1795					1800				
Ser	Thr	Pro	Ala	Ser	Phe	Ile	Asp	Phe	Ser	Arg	Gln	Arg	Gly	Leu	
1805						1810					1815				

Ala	Glu	Asp	Gly	Arg	Ile	Lys	Ala	Phe	Ala	Ala	Ala	Ala	Asp	Gly
1820						1825						1830		
Thr	Gly	Trp	Gly	Glu	Gly	Val	Gly	Ile	Leu	Leu	Val	Glu	Arg	Leu
1835						1840					1845			
Ser	Asp	Ala	Gln	Arg	Asn	Gly	His	Pro	Val	Leu	Ala	Ile	Val	Arg
1850						1855					1860			
Gly	Ser	Ala	Ile	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala
1865						1870					1875			
Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val	Ile	Arg	Gln	Ala	Leu	Ala
1880						1885					1890			
Ser	Gly	Gly	Leu	Thr	Thr	Met	Asp	Val	Asp	Ala	Val	Glu	Ala	His
1895						1900					1905			
Gly	Thr	Gly	Thr	Lys	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gln	Ala	Leu
1910						1915					1920			
Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	Pro	Glu	Gly	Arg	Pro	Leu	Leu
1925						1930					1935			
Leu	Gly	Ser	Ile	Lys	Ser	Asn	Leu	Gly	His	Thr	Gln	Ala	Ala	Ala
1940						1945					1950			
Gly	Val	Ala	Gly	Val	Met	Lys	Met	Val	Leu	Ala	Met	Gln	His	Gly
1955						1960					1965			
Val	Leu	Pro	Gln	Thr	Leu	His	Val	Asp	Glu	Pro	Thr	Pro	His	Val
1970						1975					1980			
Asp	Trp	Ser	Ala	Gly	Asp	Val	Ala	Leu	Leu	Ala	Asp	Ala	Val	Ala
1985						1990					1995			
Trp	Pro	Glu	Thr	Gly	Arg	Pro	Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe
2000						2005					2010			
Gly	Ile	Ser	Gly	Thr	Asn	Ala	His	Thr	Ile	Ile	Glu	Gln	Ala	Pro
2015						2020					2025			
Ala	Ala	Val	Ala	Pro	Val	Pro	Pro	Val	Ala	Thr	Thr	Pro	Ala	Arg
2030						2035					2040			
Ala	Asp	Gly	Pro	Gln	Pro	Trp	Leu	Leu	Ser	Ala	Lys	Thr	Arg	Asp
2045						2050					2055			
Ala	Leu	His	Asp	Gln	Ala	Arg	Arg	Leu	His	Ala	His	Ala	Glu	Leu
2060						2065					2070			
Asn	Pro	Glu	Leu	Ser	Pro	Ala	Asp	Leu	Gly	Leu	Ser	Leu	Ala	Ala
2075						2080					2085			
Gly	Arg	Ser	Ala	Phe	Glu	Arg	Arg	Ala	Ala	Val	Ile	Ala	Ala	Asp
2090						2095					2100			
Arg	Asp	Gly	Leu	Leu	Ala	Gly	Leu	Ala	Ala	Leu	Ala	Asp	Gly	Gly
2105						2110					2115			

Ala	Ala	Ala	Gly	Leu	Val	Glu	Gly	Ser	Pro	Val	Ala	Gly	Lys	Leu
2120						2125					2130			
Ala	Phe	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met	Gly
2135						2140					2145			
Arg	Glu	Leu	Tyr	Asp	Thr	Tyr	Pro	Val	Phe	Ala	Asp	Ala	Leu	Asp
2150						2155					2160			
Ala	Val	Cys	Ala	His	Val	Asp	Ala	His	Leu	Glu	Val	Pro	Leu	Lys
2165						2170					2175			
Asp	Val	Leu	Phe	Gly	Ala	Asp	Thr	Gly	Leu	Leu	Asp	Gln	Thr	Ala
2180						2185					2190			
Tyr	Thr	Gln	Pro	Ala	Leu	Phe	Ala	Val	Glu	Val	Ala	Leu	Phe	Arg
2195						2200					2205			
Leu	Val	Glu	Ser	Trp	Gly	Leu	Arg	Pro	Asp	Phe	Leu	Ala	Gly	His
2210						2215					2220			
Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe	Ser
2225						2230					2235			
Leu	Gln	Asp	Ala	Ser	Glu	Leu	Val	Val	Ala	Arg	Gly	Arg	Leu	Met
2240						2245					2250			
Gln	Ala	Leu	Pro	Thr	Gly	Gly	Val	Met	Ile	Ala	Val	Gln	Ala	Ser
2255						2260					2265			
Glu	Asp	Glu	Val	Leu	Pro	Leu	Leu	Thr	Asp	Arg	Val	Ser	Ile	Ala
2270						2275					2280			
Ala	Ile	Asn	Gly	Pro	Gln	Ser	Val	Val	Ile	Ala	Gly	Asp	Glu	Ala
2285						2290					2295			
Asp	Ala	Val	Ala	Ile	Ala	Glu	Ser	Phe	Thr	Gly	Arg	Lys	Ser	Lys
2300						2305					2310			
Arg	Leu	Thr	Val	Ser	His	Ala	Phe	His	Ser	Pro	His	Met	Asp	Gly
2315						2320					2325			
Met	Leu	Glu	Asp	Phe	Arg	Ala	Val	Ala	Glu	Gly	Leu	Ser	Tyr	Glu
2330						2335					2340			
Ala	Pro	Arg	Ile	Pro	Val	Val	Ser	Asn	Leu	Thr	Gly	Ala	Leu	Ile
2345						2350					2355			
Ser	Asp	Glu	Met	Gly	Ser	Ala	Glu	Phe	Trp	Val	Arg	His	Val	Arg
2360						2365					2370			
Glu	Ala	Val	Arg	Phe	Leu	Asp	Gly	Ile	Arg	Thr	Leu	Glu	Ala	Ala
2375						2380					2385			
Gly	Val	Thr	Lys	Tyr	Val	Glu	Leu	Gly	Pro	Asp	Gly	Val	Leu	Ser
2390						2395					2400			
Ala	Met	Ala	Gln	Asp	Cys	Val	Ser	Gly	Glu	Gly	Ser	Val	Phe	Ile
2405						2410					2415			

Pro	Val	Leu	Arg	Lys	Ala	Arg	Pro	Glu	Pro	Glu	Ser	Val	Thr	Thr
	2420					2425					2430			
Ala	Leu	Thr	Thr	Ala	His	Val	His	Gly	Ile	Pro	Val	Asp	Trp	Gln
	2435					2440					2445			
Ala	Phe	Phe	Ala	Gly	Thr	Gly	Ala	Arg	Arg	Val	Asp	Leu	Pro	Thr
	2450					2455					2460			
Tyr	Ala	Phe	Gln	Arg	Gln	Arg	Tyr	Trp	Pro	Ala	Val	Ser	Ser	Leu
	2465					2470					2475			
Tyr	Leu	Gly	Asp	Val	Glu	Ala	Ile	Gly	Leu	Asp	Asp	Thr	Ala	His
	2480					2485					2490			
Pro	Leu	Leu	Ser	Ala	Gly	Val	Ala	Leu	Pro	Glu	Ser	Asp	Gly	Met
	2495					2500					2505			
Val	Phe	Ala	Gly	Arg	Leu	Ala	Leu	Ser	Thr	His	Ala	Trp	Leu	Ala
	2510					2515					2520			
Asp	His	Ala	Ile	Leu	Gly	Ser	Val	Leu	Leu	Pro	Gly	Thr	Ala	Phe
	2525					2530					2535			
Val	Glu	Leu	Ala	Thr	Arg	Ala	Gly	Asp	Gln	Val	Gly	Cys	Asp	Tyr
	2540					2545					2550			
Leu	Glu	Glu	Leu	Thr	Leu	Glu	Ala	Pro	Leu	Val	Leu	Pro	Glu	His
	2555					2560					2565			
Gly	Gly	Val	Gln	Leu	Arg	Val	Trp	Val	Gly	Ala	Ala	Asp	Glu	Ser
	2570					2575					2580			
Gly	Arg	Arg	Pro	Phe	Ala	Leu	His	Ser	Arg	Ala	Glu	Gly	Leu	Pro
	2585					2590					2595			
Val	Glu	Glu	Pro	Trp	Thr	Arg	His	Ala	Gly	Gly	Val	Leu	Ala	Glu
	2600					2605					2610			
Gly	Gly	Arg	Pro	Pro	Ala	Asp	Phe	Asp	Leu	Thr	Ala	Trp	Pro	Pro
	2615					2620					2625			
Pro	Gly	Ala	Val	Glu	Val	Asp	Leu	Asp	Gly	Arg	Tyr	Asp	Gln	Leu
	2630					2635					2640			
Asp	Gly	Ile	Gly	Phe	Ala	Tyr	Gly	Pro	Thr	Phe	Arg	Gly	Leu	Arg
	2645					2650					2655			
Thr	Ala	Trp	Gln	Leu	Asp	Gly	Glu	Ile	Tyr	Ala	Glu	Val	Arg	Leu
	2660					2665					2670			
Pro	Glu	Gly	Ala	Glu	Gly	Glu	Ala	Gly	Arg	Phe	Gly	Leu	His	Pro
	2675					2680					2685			
Ala	Leu	Leu	Asp	Ala	Ala	Leu	His	Ala	Ile	Gly	Leu	Gly	Gly	Leu
	2690					2695					2700			
Gly	Ala	Asp	Asp	Gly	Gln	Gly	Arg	Leu	Pro	Phe	Ala	Trp	Ser	Gly
	2705					2710					2715			



Val	Ser	Leu	His	Ala	Gly	Gly	Ala	Ala	Ala	Leu	Arg	Val	His	Leu
2720						2725					2730			
Ala	Pro	Ala	Gly	Ala	Glu	Gly	Val	Arg	Leu	Glu	Ile	Ala	Asp	Ala
2735						2740					2745			
Ser	Gly	Ala	Pro	Val	Ala	Ala	Val	Glu	Ser	Leu	Gly	Leu	Arg	Pro
2750						2755					2760			
Val	Thr	Ala	Glu	Gln	Leu	Arg	Ala	Ala	Arg	Ala	Thr	Tyr	His	Glu
2765						2770					2775			
Ser	Val	Phe	Arg	Gln	Gln	Trp	Thr	Glu	Leu	Pro	Gly	Leu	Gly	Ala
2780						2785					2790			
Pro	Ala	Ala	Thr	Pro	Ala	Val	Arg	Tyr	Ala	Phe	Leu	Gly	Gly	Asp
2795						2800					2805			
Ser	Gly	Asp	Ser	Gly	Asp	Ser	Gly	Asp	Thr	Ala	Ala	Ala	Asp	Arg
2810						2815					2820			
His	Gln	Asp	Leu	Ala	Ala	Leu	Ala	Ala	Ala	Ile	Asp	Ala	Gly	Arg
2825						2830					2835			
Pro	Val	Pro	Asp	Glu	Val	Val	Val	Glu	Leu	Ala	Ala	Ala	Pro	Trp
2840						2845					2850			
Ala	Val	Ser	Ala	Ser	Ala	Val	His	Ser	Ala	Ala	His	Asp	Ala	Leu
2855						2860					2865			
Ala	Leu	Ile	Gln	Thr	Trp	Leu	Ala	Asp	Asp	Arg	Phe	Ala	Ala	Ala
2870						2875					2880			
Arg	Leu	Val	Phe	Leu	Thr	Arg	Gly	Ala	Val	Ala	Ala	Asp	Ala	Gly
2885						2890					2895			
Asp	Asp	Val	Thr	Asp	Leu	Ala	Ala	Ala	Thr	Val	Trp	Gly	Leu	Leu
2900						2905					2910			
Arg	Ser	Ala	Gln	Thr	Glu	Asn	Pro	Gly	Arg	Ile	Ala	Leu	Val	Asp
2915						2920					2925			
Thr	Asp	Gly	His	Asp	Arg	Ser	Glu	Gln	Ala	Leu	Arg	Ala	Ala	Leu
2930						2935					2940			
Thr	Ser	Asp	Glu	Glu	Arg	Phe	Ala	Leu	Arg	Ala	Gly	Ala	Val	Leu
2945						2950					2955			
Val	Pro	Arg	Leu	Ala	Arg	Val	Glu	Ile	Gln	Gln	Asp	Asp	Ser	Ala
2960						2965					2970			
Arg	Thr	Pro	Ala	Leu	Thr	Pro	Gly	Gly	Thr	Val	Leu	Ile	Thr	Gly
2975						2980					2985			
Ala	Thr	Gly	Ala	Leu	Gly	Gly	Leu	Phe	Ala	Arg	His	Leu	Ala	Ala
2990						2995					3000			
Glu	His	Gly	Val	Glu	Arg	Leu	Leu	Leu	Val	Gly	Arg	Arg	Gly	Ala
3005						3010					3015			

Asp	Ala	Pro	Gly	Ala	Ala	Glu	Leu	Val	Ala	Glu	Leu	Ala	Glu	Ser
3020						3025					3030			
Gly	Thr	Leu	Ala	Thr	Trp	Ala	Ala	Cys	Asp	Val	Ala	Asp	Arg	Asp
3035						3040					3045			
Ala	Leu	Ala	Ala	Leu	Leu	Ala	Asp	Ile	Pro	Ala	Glu	His	Pro	Leu
3050						3055					3060			
Thr	Ala	Val	Val	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	Gly	Val	Ile
3065						3070					3075			
Ser	Ser	Leu	Thr	Pro	Glu	Arg	Leu	Ser	Ala	Val	Leu	Arg	Pro	Lys
3080						3085					3090			
Val	Asp	Ala	Ala	Trp	Asn	Leu	His	Glu	Leu	Thr	Arg	Gly	Leu	Asp
3095						3100					3105			
Leu	Ala	Ala	Phe	Val	Leu	Phe	Ser	Ser	Thr	Ser	Gly	Leu	Phe	Gly
3110						3115					3120			
Gly	Pro	Gly	Gln	Gly	Asn	Tyr	Ala	Ala	Ala	Asn	Ser	Phe	Leu	Asp
3125						3130					3135			
Ala	Leu	Ala	Gln	His	Arg	Arg	Ala	His	Gly	Leu	Pro	Ala	Thr	Ser
3140						3145					3150			
Thr	Ala	Trp	Gly	Leu	Trp	Ser	Val	Ala	Asp	Gly	Met	Ala	Gly	Ala
3155						3160					3165			
Leu	Asp	Ala	Ala	Asp	Val	Asn	Arg	Met	Arg	Arg	Ala	Gly	Leu	Pro
3170						3175					3180			
Pro	Leu	Thr	Ala	Ala	Asp	Gly	Leu	Gly	Leu	Phe	Asp	Thr	Ala	Val
3185						3190					3195			
Ser	Leu	Asp	Glu	Ala	Ser	Leu	Ala	Leu	Met	Arg	Val	Asp	Thr	Glu
3200						3205					3210			
Val	Leu	Arg	Thr	Gln	Ala	Gly	Ala	Gly	Thr	Ile	Ala	Pro	Leu	Leu
3215						3220					3225			
Arg	Gly	Leu	Val	Arg	Gly	Val	Ala	Arg	Arg	Ser	Val	Asp	Val	Ser
3230						3235					3240			
Ala	Gly	Ala	Gly	Gly	Ala	Glu	Ser	Glu	Leu	Arg	Gly	Arg	Leu	Ala
3245						3250					3255			
Ala	Leu	Thr	Ala	Ala	Glu	Gln	Asp	Arg	Ala	Leu	Leu	Asp	Leu	Val
3260						3265					3270			
Arg	Thr	Gln	Val	Ala	Ala	Val	Leu	Gly	His	Ala	Gly	Pro	Ala	Ala
3275						3280					3285			
Val	Glu	Ser	Gly	Arg	Ala	Phe	Lys	Glu	Leu	Gly	Phe	Asp	Ser	Leu
3290						3295					3300			
Thr	Ala	Val	Glu	Leu	Arg	Asn	Arg	Leu	Asn	Ala	Ala	Thr	Ala	Leu
3305						3310					3315			

Arg	Leu	Pro	Ala	Thr	Leu	Ile	Phe	Asp	Tyr	Pro	Asp	Pro	Thr	Val
3320						3325					3330			
Leu	Ala	Arg	Tyr	Leu	Arg	Gly	Glu	Leu	Ile	Gly	Asp	Asp	Thr	Thr
3335						3340					3345			
Asp	Ala	Val	Ala	Glu	Pro	Leu	Thr	Ala	Val	Ala	Asp	Asp	Glu	Pro
3350						3355					3360			
Ile	Ala	Ile	Val	Ala	Met	Ser	Cys	Arg	Tyr	Pro	Gly	Asp	Val	Arg
3365						3370					3375			
Thr	Pro	Glu	Asp	Leu	Trp	Gln	Leu	Leu	Thr	Ala	Gly	Ala	Asp	Gly
3380						3385					3390			
Ile	Thr	Arg	Leu	Pro	Glu	Asn	Arg	Gly	Trp	Asp	Thr	Glu	Gly	Leu
3395						3400					3405			
Tyr	Asp	Pro	Asp	Pro	Glu	Ser	Gln	Gly	Thr	Ser	Tyr	Ala	Arg	Asp
3410						3415					3420			
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<212> PRT  
<213> Streptomyces aizunensis

<400> 31

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			20					25					30			
Gln	Glu	Pro	Ile	Ala	Val	Val	Ala	Met	Ser	Cys	Arg	Tyr	Pro	Gly	Gly	
		35					40					45				
Ile	Asp	Thr	Pro	Glu	Lys	Leu	Trp	Asp	Leu	Val	Ala	His	Gly	Arg	Asp	
	50					55					60					
Ala	Val	Ser	Ala	Tyr	Pro	Thr	Asp	Arg	Gly	Trp	Asp	Ala	Glu	Val	Leu	
65					70				75						80	
Phe	Asp	Pro	Asp	Pro	Glu	Thr	Gly	Ile	Glu	Ala	Tyr	Glu	Gln	Val	Gly	
			85					90						95		
Gly	Phe	Leu	His	Asp	Ala	Ala	Asp	Phe	Asp	Pro	Ala	Phe	Phe	Gly	Ile	
		100						105					110			
Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Leu	Leu	
		115					120					125				
Glu	Thr	Ser	Trp	Glu	Ala	Phe	Glu	Arg	Ala	Gly	Ile	Asp	Pro	Ala	Thr	
	130					135					140					
Leu	Arg	Gly	Ser	Arg	Thr	Gly	Val	Phe	Ala	Gly	Leu	Met	Tyr	His	Asp	
145					150					155					160	
Tyr	Ala	Ala	Arg	Leu	Phe	Ser	Val	Pro	Glu	Glu	Ile	Glu	Gly	Phe	Leu	
			165						170					175		
Gly	Asn	Gly	Ser	Ser	Gly	Ser	Ile	Ala	Ser	Gly	Arg	Ile	Ala	Tyr	Thr	
		180						185					190			
Leu	Gly	Leu	Glu	Gly	Pro	Ala	Val	Thr	Val	Asp	Thr	Ala	Cys	Ser	Ser	
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Ser	Leu	Val	Ala	Val	His	Leu	Ala	Ala	Gln	Ala	Leu	Arg	Asn	Gly	Glu	
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Cys	Thr	Leu	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val	Met	Ser	Thr	Pro	Gly	
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Thr	Phe	Thr	Glu	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ala	Ala	Asp	Gly	Arg		245	250	255
Cys	Lys	Ser	Phe	Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu	Gly		260	265	270
Ala	Gly	Met	Leu	Val	Leu	Glu	Arg	Leu	Ser	Glu	Ala	Arg	Arg	Asn	Gly		275	280	285
His	Pro	Val	Leu	Ala	Leu	Val	Arg	Gly	Ser	Ala	Val	Asn	Gln	Asp	Gly		290	295	300
Ala	Ser	Ser	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val		305	310	315
Ile	Arg	Gln	Ala	Leu	Ala	Gly	Ala	Arg	Leu	Ser	Ala	Thr	Gln	Val	Asp		325	330	335
Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Thr	Leu	Gly	Asp	Pro	Ile	Glu		340	345	350
Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	Pro	Asp	Gly	Arg		355	360	365
Pro	Leu	Trp	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Met	Gly	His	Thr	Gln	Ala		370	375	380
Ala	Ala	Gly	Ile	Ala	Gly	Ile	Ile	Lys	Met	Val	Met	Ala	Met	Arg	His		385	390	395
Gly	Ile	Leu	Pro	Lys	Thr	Leu	His	Val	Asp	Glu	Pro	Thr	Pro	Asn	Val		405	410	415
Asp	Trp	Ser	Glu	Gly	Ala	Val	Ser	Leu	Leu	Thr	Glu	Ser	Val	Pro	Trp		420	425	430
Pro	Glu	Thr	Gly	Ala	Pro	Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Ile		435	440	445
Ser	Gly	Thr	Asn	Ala	His	Thr	Ile	Leu	Glu	Gln	Ala	Pro	Asp	Ala	Val		450	455	460
Glu	Ala	Ala	Pro	Gly	Thr	Glu	Pro	Pro	Ala	Ala	Ala	Ala	Pro	Pro	Val		465	470	475
Pro	Pro	Leu	Trp	Thr	Leu	Ser	Ala	Lys	Ser	Pro	Ala	Ala	Leu	Arg	Ala		485	490	495
Gln	Ala	Gly	Lys	Leu	His	Ala	His	Leu	Thr	Ala	His	Pro	Gly	Leu	Arg		500	505	510
Pro	Gly	Asp	Ile	Ala	His	Ser	Leu	Ala	Val	Gly	Arg	Thr	Asp	Phe	Glu		515	520	525
His	Arg	Ala	Val	Leu	Thr	Ser	Ala	Asp	Gly	Pro	Val	Gly	Leu	Val	Arg		530	535	540
Ala	Leu	Glu	Ala	Leu	Ala	Asp	Ser	Ala	Pro	Glu	Asp	Thr	Ala	Pro	Ala		545	550	555

Asp Arg Ala Pro Gly Val Thr Arg Gly Arg Pro Val Ala Gly Lys Leu  
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 Ala Phe Leu Phe Thr Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg  
 580 585 590  
 Glu Leu Tyr Glu Thr Tyr Pro Val Phe Ala Gln Ala Leu Asp Ala Val  
 595 600 605  
 Cys Glu Arg Leu Asn Leu Glu Val Pro Leu Arg Asp Val Leu Phe Gly  
 610 615 620  
 Ala Asp Ala Gly Leu Leu Asp Gln Thr Val Tyr Thr Gln Thr Ala Leu  
 625 630 635 640  
 Phe Ala Val Glu Val Ala Leu Phe Arg Leu Val Glu Ser Trp Gly Leu  
 645 650 655  
 Lys Pro Asp Phe Leu Ala Gly His Ser Ile Gly Glu Ile Ala Ala Ala  
 660 665 670  
 His Val Ala Gly Val Phe Ser Leu Glu Asp Ala Cys Ala Leu Val Ser  
 675 680 685  
 Ala Arg Gly Arg Leu Met Gly Ala Leu Pro Gly Gly Gly Val Met Ile  
 690 695 700  
 Ala Val Gln Ala Ser Glu Asp Glu Val Leu Pro Leu Leu Thr Asp Arg  
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 Val Ser Ile Ala Ala Ile Asn Gly Pro Gln Ser Val Val Ile Ala Gly  
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 Asp Glu Ala Asp Ala Val Ala Ile Ala Glu Ser Phe Ala Asp Arg Lys  
 740 745 750  
 Ser Lys Arg Leu Thr Val Ser His Ala Phe His Ser Pro His Met Asp  
 755 760 765  
 Ala Met Leu Glu Asp Phe Arg Ala Val Ala Glu Gly Leu Ser Tyr Glu  
 770 775 780  
 Ala Pro Arg Ile Pro Val Val Ser Asn Leu Thr Gly Ala Leu Val Ser  
 785 790 795 800  
 Asp Glu Met Gly Ser Ala Asp Phe Trp Val Arg His Val Arg Glu Thr  
 805 810 815  
 Val Arg Phe Leu Asp Gly Ile Arg Ala Leu Thr Glu Arg Asn Val Val  
 820 825 830  
 His Phe Val Glu Leu Gly Pro Asp Ala Val Leu Ser Ala Met Ala Gln  
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 Asp Cys Pro Ser Ala Asp Thr Ala Ala Phe Val Pro Val Leu Arg Lys  
 850 855 860  
 Gly Arg Ser Glu Thr Gly Ser Leu Thr Asp Ala Leu Ala Arg Leu His  
 865 870 875 880

Val Gly Gly Val Ala Val Asp Trp Asp Ala Tyr Tyr Ser Gly Thr Asp  
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 Val Gln Arg Val Asp Leu Pro Thr Tyr Ala Phe Gln Arg Ala His Tyr  
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 Trp Leu Asp Ala Gly Arg Pro Leu Gly Asp Val Ser Ser Ala Gly Leu  
 915 920 925  
 Gly Ala Ala Gly His Pro Leu Leu Gly Ala Ala Val Ala Leu Ala Asp  
 930 935 940  
 Leu Asp Gly Phe Leu Tyr Thr Gly Arg Leu Ser Leu Asp Thr His Pro  
 945 950 955 960  
 Trp Leu Ala Asp His Ala Val Met Gly Ser Ala Val Leu Pro Gly Thr  
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 Ala Phe Val Glu Leu Ala Ile Arg Ala Gly Asp Gln Val Gly Cys Asp  
 980 985 990  
 Leu Leu Glu Glu Leu Thr Leu His Ala Pro Leu Val Leu Pro Pro Ala  
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 Gly Gly Val Gln Val Gln Leu Trp Val Gly Ala Pro Asp Ala Thr  
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 Gly Arg Arg Thr Leu Gly Val His Ser Arg Pro Glu Pro Ala Pro  
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 Asp Ala Val Gly Pro Asp Ala Asp Ala Ala Glu Pro Trp Thr Arg  
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 Ala Pro Asp Val Trp Pro Pro Ala Gly Ala Arg Pro Leu Pro Val  
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 Pro Ala Phe Gln Gly Val Arg Ala Ala Trp Ala Ser Asp Asp Ala  
 1100 1105 1110  
 Ala Tyr Val Glu Ile Ala Ala Ala Asp Gly Gln Trp Ala Asp Ala  
 1115 1120 1125  
 Pro Leu Phe Gly Leu His Pro Ala Leu Leu Asp Ser Ala Leu His  
 1130 1135 1140  
 Ala Ile Gly Leu Ala Gly Leu Val Glu Asp Thr Gly Arg Gly Arg  
 1145 1150 1155  
 Leu Pro Phe Ser Trp Ser Gly Val Ser Leu Tyr Ala Val Gly Ala  
 1160 1165 1170  
 Ser Val Leu Arg Val Arg Leu Ala Lys Ala Gly Pro Asp Ala Val  
 1175 1180 1185

Ser	Leu	Ala	Leu	Ala	Asp	Gly	Ala	Gly	Gln	Pro	Val	Gly	Asp	Ile
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1220						1225					1230			
Pro	Leu	Asn	Leu	Pro	Arg	Ala	Val	Asp	Ser	Arg	Trp	Ala	Val	Leu
1235						1240					1245			
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His	Ala	Asp	Ala	Glu	Ala	Leu	Ser	Ala	Ala	Leu	Asp	Ala	Gly	Ala
1265						1270					1275			
Pro	Val	Pro	Asp	Ala	Val	Leu	Val	Arg	His	Pro	Ala	Leu	Pro	Glu
1280						1285					1290			
Pro	Thr	Pro	Glu	Ala	Val	His	Gln	Ala	Ala	His	Arg	Thr	Leu	Gly
1295						1300					1305			
Leu	Leu	Arg	His	Trp	Leu	Gly	Asp	Asp	Arg	Leu	Ala	Asp	Ser	Arg
1310						1315					1320			
Leu	Val	Leu	Leu	Thr	His	Gly	Ala	Val	Ala	Ala	Gly	Asp	Ala	Asp
1325						1330					1335			
Gln	Val	Pro	Asp	Pro	Val	His	Ala	Val	Val	Trp	Gly	Leu	Val	Arg
1340						1345					1350			
Ser	Ala	Gln	Ser	Glu	His	Pro	Gly	Arg	Phe	Leu	Leu	Ile	Asp	Ser
1355						1360					1365			
Asp	Ser	Gly	Ile	Asp	Thr	Leu	Ser	Trp	Pro	Thr	Phe	Gly	Ala	Val
1370						1375					1380			
Leu	Ala	Ser	Glu	Glu	Pro	Gln	Val	Ala	Leu	Arg	Gly	Gly	Val	Ala
1385						1390					1395			
His	Ala	Pro	Arg	Leu	Ala	Lys	Val	Pro	Ala	Thr	Ala	Thr	Ala	Ala
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Ala	Val	Val	Glu	Thr	Ser	Ser	Tyr	Asp	Pro	Asp	Gly	Thr	Val	Leu
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Val	Thr	Gly	Ala	Ser	Gly	Thr	Leu	Gly	Gly	Leu	Val	Ala	Arg	His
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Leu	Val	Thr	Gly	Arg	Gly	Val	Arg	Arg	Leu	Leu	Leu	Leu	Ser	Arg
1445						1450					1455			
Arg	Gly	Ala	Asp	Ala	Pro	Gly	Ala	Gly	Glu	Leu	Ala	Ala	Glu	Leu
1460						1465					1470			
Thr	Gly	Leu	Gly	Ala	Glu	Val	Ser	Trp	Ala	Ala	Cys	Asp	Ala	Gly
1475						1480					1485			

Asp	Arg	Asp	Ala	Leu	Ala	Ala	Val	Leu	Ala	Ala	Val	Pro	Ala	Ala	
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His	Pro	Leu	Thr	Ala	Val	Val	His	Thr	Ala	Gly	Val	Leu	Asp	Asp	
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Gly	Val	Ile	Gly	Ser	Leu	Thr	Pro	Glu	Arg	Leu	Asp	Thr	Val	Leu	
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Phe	Leu	Asp	Ala	Leu	Ala	Gln	Tyr	Arg	Arg	Ala	His	Gly	Leu	Pro	
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Phe	Asp	Ser	Leu	Thr	Ala	Val	Glu	Leu	Arg	Asn	Arg	Leu	Gly	Ala	
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1775						1780					1785				

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Asp	Asp	Asp	Pro	Ile	Ala	Ile	Val	Ala	Met	Ser	Cys	Arg	Tyr	Pro
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Gly	Gly	Val	Thr	Thr	Pro	Glu	Glu	Leu	Trp	Gln	Leu	Leu	Ala	Gly
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Gly	Gly	Asp	Ala	Ile	Ser	Gly	Phe	Pro	Ala	Asp	Arg	Gly	Trp	Asp
1850						1855					1860			
Val	Glu	Ser	Leu	Tyr	Asp	Pro	Asp	Pro	Asp	His	Pro	Gly	Thr	Ser
1865						1870					1875			
Tyr	Thr	Arg	His	Gly	Gly	Phe	Leu	Arg	Asp	Ala	Ala	Ala	Phe	Asp
1880						1885					1890			
Pro	Thr	Phe	Phe	Gly	Ile	Ser	Pro	Arg	Glu	Ala	Val	Gly	Thr	Asp
1895						1900					1905			
Pro	Gln	Gln	Arg	Leu	Leu	Leu	Glu	Thr	Thr	Trp	Glu	Ala	Phe	Glu
1910						1915					1920			
Arg	Ala	Gly	Ile	Asp	Pro	Ala	Thr	Val	Arg	Gly	Ser	Arg	Thr	Gly
1925						1930					1935			
Val	Phe	Ala	Gly	Val	Met	Tyr	His	Asp	Tyr	Ala	Ala	Leu	Leu	Glu
1940						1945					1950			
Arg	Ser	Lys	Asp	Gly	Ala	Asp	Gly	Ser	Leu	Gly	Ser	Gly	Ser	Thr
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Gly	Ser	Ile	Ala	Ser	Gly	Arg	Val	Ser	Tyr	Thr	Phe	Gly	Leu	Glu
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Gly	Pro	Ala	Val	Thr	Ile	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val
1985						1990					1995			
Ala	Leu	His	Met	Ala	Ile	Gln	Ala	Leu	Arg	Thr	Gly	Glu	Cys	Asp
2000						2005					2010			
Met	Ala	Leu	Ala	Gly	Gly	Val	Thr	Val	Met	Ala	Thr	Pro	Gly	Thr
2015						2020					2025			
Phe	Ile	Gly	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ser	Ala	Asp	Gly	Arg
2030						2035					2040			
Cys	Arg	Ala	Phe	Ser	Ala	Asp	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu
2045						2050					2055			
Gly	Val	Gly	Met	Leu	Leu	Val	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg
2060						2065					2070			
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2075						2080					2085			



Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Pro Ser	2090	2095	2100
Gln Gln Arg Val Ile Arg Ala Ala Leu Ala Ser Ala Gly Leu Ser	2105	2110	2115
Ala Ala Glu Val Asp Ala Val Glu Ala His Gly Thr Gly Thr Thr	2120	2125	2130
Leu Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly	2135	2140	2145
Arg Glu His Thr Glu Asp Ser Pro Leu Trp Leu Gly Ser Ile Lys	2150	2155	2160
Ser Asn Met Gly His Thr Gln Ala Ala Ala Gly Val Ala Gly Val	2165	2170	2175
Ile Lys Met Val Leu Ala Ile Gln His Gly Val Leu Pro Arg Thr	2180	2185	2190
Leu His Ala Asp Arg Pro Ser Pro His Val Asp Trp Ser Gln Gly	2195	2200	2205
Ala Val Ser Leu Leu Thr Glu Ser Val Pro Trp Pro Glu Thr Gly	2210	2215	2220
Arg Pro Arg Arg Ala Gly Val Ser Ser Phe Gly Ile Ser Gly Thr	2225	2230	2235
Asn Ala His Thr Ile Ile Glu Gln Ala Pro Glu Glu Ala Thr Val	2240	2245	2250
Ala Pro Ala Asp Ala Val Ala Ala Pro Ser Ala Leu Pro Leu Gln	2255	2260	2265
Leu Ala Gly Arg Ser Ala Glu Ala Leu Ser Ala Gln Ala Arg Ala	2270	2275	2280
Leu Ser Ala His Leu Thr Ala His Pro Asp Val Pro Leu Ala Asp	2285	2290	2295
Leu Ala Tyr Ser Leu Ala Thr Ser Arg Ala Thr Phe Asp His Arg	2300	2305	2310
Ala Val Leu Val Ala Thr Glu Gly Thr Thr Ala Ala Thr Ala Val	2315	2320	2325
Thr Ala Leu Asp Ala Leu Ala Asp Arg Arg Thr Ala Pro Gly Leu	2330	2335	2340
Val Arg Gly Thr Ala Ser Lys Gly Gly Arg Thr Ala Phe Leu Phe	2345	2350	2355
Thr Gly Gln Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr	2360	2365	2370
Glu Ala His Pro Val Phe Ala Arg Ala Leu Asp Ala Val Cys Asp	2375	2380	2385

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2405						2410					2415			
Val	Glu	Val	Ala	Leu	Phe	Arg	Leu	Leu	Glu	Ser	Trp	Gly	Val	Lys
2420						2425					2430			
Pro	Asp	Phe	Leu	Ala	Gly	His	Ser	Ile	Gly	Glu	Ile	Ala	Ala	Ala
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His	Val	Ala	Gly	Val	Leu	Ser	Leu	Asp	Asp	Val	Cys	Ala	Leu	Val
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Glu	Ala	Arg	Gly	Arg	Leu	Met	Gly	Ala	Leu	Pro	Gly	Gly	Gly	Val
2465						2470					2475			
Met	Ile	Ala	Val	Gln	Ala	Ser	Glu	Ala	Glu	Val	Leu	Pro	Leu	Leu
2480						2485					2490			
Thr	Asp	Arg	Val	Ser	Ile	Ala	Ala	Ile	Asn	Gly	Pro	Arg	Ser	Val
2495						2500					2505			
Val	Ile	Ala	Gly	Asp	Glu	Ala	Asp	Ala	Val	Ala	Ile	Val	Glu	Ser
2510						2515					2520			
Phe	Thr	Asp	Arg	Lys	Ser	Lys	Arg	Leu	Thr	Val	Ser	His	Ala	Phe
2525						2530					2535			
His	Ser	Pro	His	Met	Asp	Gly	Met	Leu	Asp	Ala	Phe	Arg	Glu	Ile
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2555						2560					2565			
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2570						2575					2580			
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Ile	His	Ala	Leu	Glu	Ala	Ala	Gly	Val	Thr	Thr	Tyr	Val	Glu	Leu
2600						2605					2610			
Gly	Pro	Asp	Gly	Val	Leu	Ser	Ala	Met	Ala	Gln	Glu	Cys	Val	Thr
2615						2620					2625			
Gly	Glu	Asp	Ser	Val	Phe	Val	Pro	Val	Leu	Arg	Ser	Gly	Arg	Pro
2630						2635					2640			
Glu	Ala	Glu	Ser	Val	Thr	Thr	Ala	Leu	Ala	Gln	Ala	His	Val	Arg
2645						2650					2655			
Gly	Ile	Ala	Val	Asp	Trp	Gln	Ala	Tyr	Phe	Ala	Gly	Thr	Ser	Ala
2660						2665					2670			
Gln	Arg	Val	Asp	Leu	Pro	Thr	Tyr	Arg	Phe	Gln	Arg	Glu	His	Tyr
2675						2680					2685			

Trp	Pro	Glu	Thr	Gly	Ile	Pro	Leu	Pro	Gly	Asp	Thr	Ala	Gly	Leu
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Gly	Leu	Ala	Ala	Ala	Gly	His	Pro	Leu	Leu	Gly	Ala	Ala	Val	Thr
2705						2710					2715			
Leu	Ala	Asp	Ala	Asp	Gly	Cys	Val	Leu	Thr	Gly	Arg	Leu	Ser	Leu
2720						2725					2730			
Arg	Thr	His	Pro	Trp	Leu	Ala	Asp	His	Ala	Val	Met	Gly	Ser	Val
2735						2740					2745			
Leu	Leu	Pro	Gly	Thr	Ala	Leu	Val	Glu	Leu	Ala	Leu	His	Ala	Gly
2750						2755					2760			
Glu	Arg	Val	Gly	Thr	Arg	Ala	Leu	Asp	Glu	Leu	Thr	Leu	Gln	Ala
2765						2770					2775			
Pro	Leu	Ile	Leu	Pro	Asn	Glu	Gly	Ala	Val	Gln	Leu	Gln	Val	Val
2780						2785					2790			
Val	Gly	Ala	Pro	Asp	Ala	Ala	Gly	His	Arg	Thr	Val	Ala	Val	Tyr
2795						2800					2805			
Ser	Arg	Pro	Asp	Ala	Asp	Gly	Glu	Ala	Trp	Val	Arg	His	Ala	Asp
2810						2815					2820			
Gly	Leu	Leu	Val	Asp	Glu	Val	Arg	Gly	Ala	Ala	Ala	Asp	Leu	Gly
2825						2830					2835			
Val	Trp	Pro	Pro	Ala	Gly	Ala	Thr	Ala	Val	Pro	Val	Asp	Asp	Ala
2840						2845					2850			
Tyr	Ala	Ile	Leu	Glu	Thr	Ser	Gly	Leu	Ala	Tyr	Gly	Pro	Leu	Phe
2855						2860					2865			
Gln	Gly	Leu	Arg	Ala	Ala	Trp	Arg	Arg	Ala	Gly	Glu	Leu	Phe	Ala
2870						2875					2880			
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2885						2890					2895			
Gly	Leu	His	Pro	Ala	Leu	Leu	Asp	Ser	Ala	Leu	His	Thr	Leu	Ala
2900						2905					2910			
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 <212> PRT  
 <213> Streptomyces aizunensis

<400> 33

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			20					25					30			
Gln	Glu	Pro	Ile	Ala	Ile	Val	Ala	Met	Ser	Cys	Arg	Tyr	Pro	Gly	Gly	
			35				40					45				
Val	Arg	Ser	Pro	Glu	Asp	Leu	Trp	Arg	Leu	Val	Glu	Asn	Gly	Asp	Asp	
			50			55					60					
Ala	Val	Ser	Gly	Phe	Pro	Val	Asp	Arg	Gly	Trp	Asp	Val	Glu	Ala	Leu	
65					70				75					80		
Tyr	Asp	Ala	Asp	Pro	Asp	Ser	Ser	Gly	Ser	Ser	Tyr	Val	Ser	Glu	Gly	
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Gly	Phe	Leu	Tyr	Asp	Ala	Ala	Ser	Phe	Asp	Pro	Ala	Pro	Phe	Gly	Ile	
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Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	Gln	Gln	Arg	Leu	Leu	Leu	
			115				120					125				
Glu	Ala	Ser	Trp	Glu	Ala	Phe	Glu	Arg	Ala	Gly	Ile	Asp	Pro	Ser	Ser	
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Val	Arg	Gly	Ser	Arg	Thr	Ala	Val	Phe	Ala	Gly	Val	Met	Tyr	His	Asp	
145					150					155					160	
Tyr	Thr	Ala	Arg	Leu	Asp	Ser	Val	Pro	Glu	Gly	Val	Glu	Gly	Phe	Leu	
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Gly	Thr	Gly	Ser	Ser	Gly	Ser	Ile	Ala	Ser	Gly	Arg	Val	Ala	Tyr	Thr		
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Phe	Gly	Leu	Glu	Gly	Pro	Ala	Val	Thr	Val	Asp	Thr	Ala	Cys	Ser	Ser		
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Ser	Leu	Val	Thr	Leu	His	Leu	Ala	Val	Gln	Ala	Leu	Arg	Ala	Gly	Glu		
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Thr	Phe	Thr	Glu	Phe	Ser	Arg	Gln	Arg	Gly	Leu	Ala	Pro	Asp	Gly	Arg		
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Cys	Lys	Pro	Phe	Ala	Ala	Ala	Ala	Asp	Gly	Thr	Gly	Trp	Gly	Glu	Gly		
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Val	Gly	Met	Leu	Leu	Val	Glu	Arg	Leu	Ser	Asp	Ala	Gln	Arg	Asn	Gly		
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His	Pro	Ile	Leu	Ala	Val	Val	Arg	Gly	Ser	Ala	Ile	Asn	Gln	Asp	Gly		
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Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	Pro	Ala	Gly	Arg		
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Pro	Leu	Leu	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Ile	Gly	His	Thr	Gln	Ala		
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Ala	Ala	Gly	Val	Ala	Ser	Ile	Ile	Lys	Met	Val	Glu	Ala	Met	Arg	His		
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Gly	Val	Val	Pro	Lys	Thr	Leu	His	Leu	Asp	Glu	Pro	Thr	Pro	His	Val		
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Asp	Trp	Glu	Ala	Gly	Ala	Val	Ser	Leu	Ile	Gly	Glu	Lys	Ile	Ala	Trp		
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Pro	Glu	Thr	Gly	Glu	Leu	Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Phe		
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Glu	Val	Ala	Gly	Asp	Pro	Ala	Gly	Glu	Val	Glu	Gly	Ser	Glu	Leu	Ala		
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Val	Val	Pro	Trp	Val	Leu	Ser	Gly	Lys	Ser	Ala	Gly	Ala	Leu	Arg	Ala		
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Gln	Ala	Glu	Arg	Leu	Ser	Gly	Trp	Leu	Ala	Gly	Ala	Ser	Ala	Ala	Gly	500	505	510
Val	Ala	Ser	Val	Asp	Val	Gly	Trp	Ser	Leu	Ala	Ser	Ser	Arg	Ala	Gly	515	520	525
Leu	Glu	His	Arg	Ala	Val	Val	Leu	Gly	Asp	His	Ala	Ala	Gly	Val	Gly	530	535	540
Ala	Val	Ala	Ser	Gly	Val	Met	Ala	Ala	Gly	Val	Val	Thr	Gly	Ser	Val	545	550	555
Val	Gly	Gly	Lys	Thr	Ala	Phe	Val	Phe	Pro	Gly	Gln	Gly	Ser	Gln	Trp	565	570	575
Val	Gly	Met	Ala	Val	Gly	Leu	Leu	Asp	Ser	Ser	Pro	Val	Phe	Ala	Ala	580	585	590
Arg	Val	Asp	Glu	Cys	Ala	Lys	Ala	Leu	Glu	Pro	Phe	Thr	Asp	Trp	Ser	595	600	605
Leu	Val	Asp	Val	Leu	Arg	Gly	Val	Glu	Gly	Ala	Pro	Ser	Leu	Glu	Arg	610	615	620
Val	Asp	Val	Val	Gln	Pro	Ala	Leu	Phe	Ala	Val	Met	Val	Ser	Leu	Ala	625	630	635
Glu	Val	Trp	Arg	Ala	Ala	Gly	Val	Arg	Pro	Gly	Ala	Val	Ile	Gly	His	645	650	655
Ser	Gln	Gly	Glu	Ile	Ala	Ala	Ala	Cys	Val	Ala	Gly	Ile	Leu	Ser	Leu	660	665	670
Glu	Asp	Ala	Ala	Arg	Val	Val	Ala	Leu	Arg	Ser	Gln	Ala	Ile	Gly	Arg	675	680	685
Val	Leu	Ala	Gly	Leu	Gly	Gly	Met	Val	Ser	Val	Pro	Leu	Pro	Ala	Lys	690	695	700
Ala	Val	Arg	Glu	Leu	Ile	Ala	Pro	Trp	Gly	Glu	Gly	Arg	Ile	Ser	Val	705	710	715
Ala	Ala	Val	Asn	Gly	Pro	Ser	Ser	Val	Val	Val	Ser	Gly	Glu	Ala	Ala	725	730	735
Ala	Leu	Asp	Glu	Met	Leu	Ala	Ser	Cys	Glu	Ser	Glu	Gly	Val	Arg	Ala	740	745	750
Lys	Arg	Ile	Ala	Val	Asp	Tyr	Ala	Ser	His	Ser	Ala	Gln	Val	Glu	Leu	755	760	765
Leu	Arg	Glu	Glu	Leu	Ala	Glu	Leu	Leu	Ala	Pro	Ile	Val	Pro	Arg	Ala	770	775	780
Ala	Glu	Val	Pro	Phe	Leu	Ser	Thr	Val	Thr	Gly	Glu	Trp	Val	Arg	Gly	785	790	795
Pro	Glu	Leu	Asp	Ala	Gly	Tyr	Trp	Phe	Gln	Asn	Leu	Arg	Arg	Thr	Val	805	810	815

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 Glu Arg Ser Ala Val Asp Gly Trp Arg Tyr Arg Val Thr Trp Lys Pro  
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 Ala Thr Gly Arg Ser Glu Gln Val Ala Asp Pro Ala Gln Ala Pro  
 1115 1120 1125



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Trp Gly Gly Leu Ile Asp	Leu Pro Gly Thr Asp	Ala Val Asp Asp
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Arg Ala Leu Ala Arg Leu	Ala Gly Val Leu Ala	Gly Asp Ala Ala
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Glu Asp Gln Val Ala Val	Arg Ala Ser Gly Leu	Phe Val Arg Arg
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Leu Val Arg Val Arg Leu	Ala Glu Thr Pro Val	Val Arg Glu Trp
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Arg Pro Gln Gly Thr Thr	Leu Val Thr Gly Gly	Thr Gly Ala Leu
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Gln Ile Glu Arg Val Leu	Arg Val Lys Val Asp	Ala Thr Leu His
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Tyr Ala Pro Gly Asn Ala	Phe Leu Asp Ala Phe	Ala Glu Tyr Arg
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Arg Ala Ser Gly Leu Pro	Ala Thr Ser Ile Ala	Trp Gly Pro Trp
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Gly Asp Gly Gly Met Ala	Glu Gly Ala Val Gly	Asp Arg Met Arg
1385	1390	1395
Arg His Gly Val Ile Glu	Met Ser Pro Glu Arg	Ala Val Ala Ala
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Leu Gln His Ala Leu Asp	Arg Asp Glu Thr Thr	Leu Thr Val Ala
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Ala Arg	Pro Leu Leu His	Asp Leu Pro Glu Ala Arg	Glu Val Met
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Ala Leu	Ala Gln Gln Leu Thr	Gly Arg Pro Glu Ala	Glu Gln Glu
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Arg Leu	Leu Leu Glu Leu Val	Arg Thr Ala Val Ala	Ala Val Leu
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Gly Tyr	Ala Gly Pro Asp	Ala Val Glu Ala Gly Arg	Ala Phe Lys
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Glu Leu	Gly Phe Asp Ser	Leu Thr Ser Val Glu Leu	Arg Asn Arg
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Ala Phe	Glu Arg Ala Gly	Ile Asp Pro Gln Thr Leu	Arg Gly Ser
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1940						1945					1950			
Pro	Gln	Ser	Leu	His	Ile	Ala	Glu	Pro	Thr	Pro	His	Val	Asp	Trp
1955						1960					1965			
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1970						1975					1980			
Glu	Thr	Gly	Arg	Pro	Trp	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Phe
1985						1990					1995			
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 <212> PRT  
 <213> Streptomyces aizunensis

<400> 35

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 Arg Phe Pro Gly Gly Ile Glu Ser Pro Glu Gly Leu Trp Asp Leu Val  
 50 55 60  
 Ala Gly Gly Arg Asp Ala Ile Thr Asp Phe Pro Thr Asp Arg Gly Trp  
 65 70 75 80  
 Asp Ile Glu Ser Leu Tyr Asp Ala Asp Pro Asp Gln Gln Gly Thr Ser  
 85 90 95  
 Tyr Thr Arg Glu Gly Gly Phe Leu Asp Gly Val Gly Lys Phe Asp Ala  
 100 105 110  
 Ser Phe Phe Gly Ile Ser Pro Arg Glu Thr Leu Gly Met Asp Pro Gln

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Thr	Asn	Gly	Gln	Asp	Tyr	Pro	Glu	Leu	Leu	Arg	Glu	Val	Pro	Lys	Gly
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Ile	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro
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Ser	Gln	Gln	Arg	Val	Ile	Arg	Gln	Ala	Leu	Thr	Asn	Ala	Gly	Leu	Thr
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Ala	Pro	Pro	Ala	Asp	Asp	Ala	Pro	Glu	Thr	Gly	Ala	Asp	Thr	Ala	Pro
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Leu	Phe	Gly	Asp	Arg	Asp	Ser	Leu	Leu	Ala	Asp	Leu	Ser	Ala	Leu	Ala
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Glu	Gly	Glu	Gln	Pro	Ala	Gly	Pro	Val	Leu	Gly	Ala	Val	Gly	Glu	Gly
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Lys	Thr	Ala	Phe	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln	Arg	Leu	Gly	Met
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Gly	Arg	Glu	Leu	Tyr	Ala	Thr	His	Pro	Gly	Phe	Ala	Arg	Ala	Leu	Asp
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Glu	Val	Arg	Ala	Glu	Leu	Asp	Gln	His	Leu	Glu	Arg	Pro	Leu	Phe	Asp
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Val	Leu	Phe	Ala	Ala	Glu	Gly	Thr	Pro	Glu	Ala	Asp	Leu	Leu	Asp	Glu
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Thr	Ala	Tyr	Thr	Gln	Ser	Ala	Leu	Phe	Ala	Val	Glu	Val	Ala	Leu	Phe
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Leu	Pro	Thr	Tyr	Ala	Phe	Gln	Arg	Glu	Leu	Tyr	Trp	Pro	Glu	Gln	Pro
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His	Thr	Val	Met	Asp	Thr	Val	Leu	Leu	Pro	Gly	Thr	Ala	Phe	Val	Glu
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Tyr Ala 1115	Tyr Leu Thr Glu 1120	Gly Phe Ala Tyr 1125
Gln Gly 1130	Leu Thr Gly Ala 1135	Gly Pro Val Phe 1140
Glu Val 1145	Arg Leu Pro Glu 1150	Glu Val Phe Ala 1155
Gly Leu 1160	His Pro Ala Leu 1165	Ala His Ala Glu 1170
Ile Gly 1175	Ser Leu Leu Glu 1180	Ala Asp Ala Ala Leu 1185
Ser Trp 1190	Ser Gly Val Ser 1195	Arg Leu Pro Phe 1200
Arg Val 1205	Arg Leu Ala Pro 1210	Ala Arg Ala Leu 1215
Leu Ala 1220	Asp Glu Thr Gly 1225	Val Ser Val Thr 1230
Leu Leu 1235	Arg Pro Val Ser 1240	Ala Asp Ala Leu 1245
Ala Phe 1250	His Asp Ser Leu 1255	Ala Arg Thr 1260
Leu Pro 1265	Ala Ala Thr Thr 1270	Ala Thr Pro 1275
Gly Glu 1280	Pro Arg Thr Glu 1285	Ala Thr Pro 1290
Thr His 1295	Ala Asp Leu Ala 1300	Ala Thr Pro 1305
Gly Pro 1310	Val Pro Arg Ala 1315	Ala Thr Pro 1320
Ala Pro 1325	Ser Ala Thr Pro 1330	Ala Thr Pro 1335
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Ala Asp 1355	Asp Arg Phe Ala 1360	Ala Thr Pro 1365
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Pro Ala Glu His Pro Leu	Thr Ala Val Val His Thr Ala Gly Val			
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Ser Gly Met Thr Gly Asp	Leu Ala Asp Ala Asp Leu Glu Arg Ile			
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Ala	Leu	Tyr	Asp	Ala	Asp	Pro	Gly	Arg	Ala	Gly	Thr	Ser	Tyr	Thr	
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Arg	Glu	Gly	Gly	Phe	Leu	His	Asp	Ala	Ala	Asp	Phe	Asp	Pro	Asp	
1895						1900					1905				
Val	Phe	Gly	Ile	Asn	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro	His	
1910						1915					1920				
Gln	Arg	Leu	Leu	Leu	Glu	Thr	Ser	Trp	Glu	Ala	Phe	Glu	Gln	Ala	
1925						1930					1935				
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1955						1960					1965				
Pro	Glu	Gly	Leu	Glu	Gly	Tyr	Leu	Gly	Thr	Gly	Thr	Ala	Gly	Ser	

1970	1975	1980
Val Ala Ser Gly Arg Ile 1985	Ser Tyr Thr Phe Gly 1990	Leu Glu Gly Pro 1995
Ala Val Thr Val Asp Thr 2000	Ala Cys Ser Ser Ser 2005	Leu Val Ala Leu 2010
His Leu Ala Ala Gln Ala 2015	Leu Arg Asn Gly Glu 2020	Cys Asp Met Ala 2025
Leu Ala Gly Gly Val Thr 2030	Val Met Ser Thr Pro 2035	Asp Thr Phe Ile 2040
Asp Phe Ser Arg Gln Arg 2045	Gly Leu Ser Gly Asn 2050	Gly Arg Cys Lys 2055
Ser Phe Ser Ala Asp Ala 2060	Asp Gly Thr Gly Trp 2065	Ala Glu Gly Ala 2070
Gly Met Ile Leu Val Glu 2075	Arg Leu Ser Asp Ala 2080	Arg Arg Asn Gly 2085
His Gln Val Leu Ala Val 2090	Val Arg Gly Thr Ala 2095	Val Asn Gln Asp 2100
Gly Ala Ser Asn Gly Leu 2105	Thr Ala Pro Asn Gly 2110	Pro Ser Gln Gln 2115
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Asp Pro Ile Glu Ala Gln 2150	Ala Leu Leu Ala Thr 2155	Tyr Gly Gln Asp 2160
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Ile Gly His Thr Gln Ala 2180	Ala Ala Gly Ala Ala 2185	Gly Ile Ile Lys 2190
Met Ile Leu Ala Met Arg 2195	His Gly Val Met Pro 2200	Pro Ser Leu His 2205
Ile Gly Glu Pro Ser Pro 2210	His Ile Asp Trp Thr 2215	Ala Gly Ala Val 2220
Ser Leu Leu Thr Glu Ala 2225	Ala Glu Trp Pro Asp 2230	Ala Gly Arg Pro 2235
Arg Arg Ala Gly Ile Ser 2240	Ser Phe Gly Val Ser 2245	Gly Thr Asn Ala 2250
His Val Ile Ile Glu Gln 2255	Pro Pro Val Glu Glu 2260	Pro Ala Thr Ala 2265
Thr Glu Thr Gly Ser Gly 2270	Thr Gly Leu Pro Ala 2275	Gly Thr Pro Leu 2280

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Leu Asp Pro His Leu Glu	Gln Pro Leu Lys Glu	Val Leu Phe Thr
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Leu Phe Ala Leu Glu Thr	Ala Leu Tyr Arg Leu	Val Glu Ser Trp
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Gly Val Arg Pro Asp Phe	Val Ala Gly His Ser	Ile Gly Glu Ile
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Thr Ala Ala His Val Ala	Gly Val Leu Ser Leu	Pro Asp Ala Ala
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Thr Leu Val Ala Ala Arg	Gly Arg Leu Met Gln	Glu Leu Pro Glu
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Gly Gly Ala Met Ile Ala	Leu Thr Ala Thr Glu	Asp Glu Val Leu
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Leu Glu Ile Ala Ala Glu	Phe Glu Arg Arg Gly	Arg Arg Thr Lys
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Ala Pro Ala Ile Pro Val	Val Thr Leu Leu Thr	Gly Thr Val Ala
2585	2590	2595
Gly Asp Glu Leu Arg Thr	Ala Glu His Trp Val	Ser His Val Arg
2600	2605	2610
Glu Ala Val Arg Phe Leu	Asp Gly Ile Arg Thr	Leu Asp Ala Glu
2615	2620	2625
His Val Thr Thr Tyr Leu	Glu Leu Gly Pro Gln	Gly Val Leu Ser
2630	2635	2640
Gly Leu Gly Arg Asp Cys	Leu Thr Asp Pro Ala	Asp Pro Ala Asp
2645	2650	2655
Thr Ala Val Phe Val Pro	Ala Leu Arg Arg Asp	Arg Gly Glu Ala
2660	2665	2670
Glu Ala Leu Thr Ala Ala	Ile Ala Ala Ala His	Thr Arg Gly Val
2675	2680	2685
Pro Leu Asp Trp Ser Ala	Tyr Phe Ala Gly Thr	Gly Ala Arg Arg
2690	2695	2700
Val Glu Leu Pro Thr Tyr	Ala Phe Gln Arg Glu	Arg Phe Trp Leu
2705	2710	2715
Glu Ala Pro Ala Gly Tyr	Ile Gly Asp Val Glu	Ser Ala Gly Met
2720	2725	2730
Gly Ala Ala His His Pro	Leu Leu Gly Ala Ala	Val Ala Leu Ala
2735	2740	2745
Asp Gly Glu Gly Phe Leu	Phe Thr Gly Arg Leu	Ser Leu Asp Thr
2750	2755	2760
His Pro Trp Leu Ala Asp	His Ala Val Met Gly	Asn Val Leu Leu
2765	2770	2775
Pro Gly Thr Ala Phe Val	Glu Leu Ala Ile Arg	Ala Gly Asp Gln
2780	2785	2790
Ala Gly Cys Asp Leu Leu	Glu Glu Leu Thr Leu	Glu Ala Pro Leu
2795	2800	2805
Ile Leu Ala Pro Gln Ala	Ala Ala Arg Leu Gln	Ile Val Val Gly
2810	2815	2820
Ala Pro Asp Gly Ser Gly	Arg Arg Thr Leu Asp	Val Tyr Ser Ser
2825	2830	2835
Asp Pro Asp Ala Pro Ala	Asp Glu Pro Trp Thr	Arg His Ala Gly
2840	2845	2850
Gly Ile Leu Ala Thr Gly	Ala Gln Ala Pro Ala	Phe Asp Leu Thr
2855	2860	2865
Ala Trp Pro Pro Pro Gly	Ala Glu Ala Val Gly	Val Asp Gly Leu

2870					2875					2880				
Tyr	Glu	His	Leu	Gly	Arg	Gly	Gly	Phe	Ala	Tyr	Gly	Pro	Val	Phe
	2885						2890				2895			
Gln	Gly	Leu	Arg	Ala	Ala	Trp	Leu	Leu	Gly	Asp	Asp	Val	Tyr	Ala
	2900					2905					2910			
Glu	Val	Ala	Leu	Pro	Asp	Asp	Arg	Gln	Ala	Glu	Ala	Ala	Arg	Phe
	2915					2920					2925			
Gly	Leu	His	Pro	Ala	Leu	Leu	Asp	Ala	Ala	Leu	His	Ala	Thr	Phe
	2930					2935					2940			
Val	Gln	Pro	Ser	Pro	Asp	Gly	Asp	Gln	Gln	Gly	Arg	Leu	Pro	Phe
	2945					2950					2955			
Ser	Trp	Arg	Asp	Val	Ser	Leu	His	Ala	Val	Gly	Ala	Ser	Ala	Leu
	2960					2965					2970			
Arg	Val	Arg	Leu	Thr	Pro	Asp	Gly	Arg	Asp	Thr	Leu	Ser	Leu	Gln
	2975					2980					2985			
Leu	Ala	Asp	Thr	Thr	Gly	Ala	Pro	Val	Ala	Ala	Val	Gly	His	Leu
	2990					2995					3000			
Thr	Leu	Arg	Pro	Val	Ser	Ala	Asp	Gln	Leu	Gly	Ser	Ala	Arg	Ser
	3005					3010					3015			
Ala	His	His	Glu	Ser	Leu	Phe	Arg	Ile	Asp	Trp	Ala	Thr	Val	Pro
	3020					3025					3030			
Leu	Pro	Ser	Asp	Ala	Pro	Ala	Ala	Thr	Asp	Glu	Trp	Ala	Val	Ile
	3035					3040					3045			
Ala	Ala	Asp	Gly	Gly	Thr	Asp	Gly	Gly	Thr	Asp	Gly	Gly	Thr	Asp
	3050					3055					3060			
Gly	Gly	Ile	Pro	Ala	Ala	Leu	Pro	Gly	Arg	Val	His	Thr	Gly	Leu
	3065					3070					3075			
Asp	Ala	Leu	Gly	Ala	Ala	Val	Asp	Ala	Gly	Ala	Pro	Val	Pro	Ala
	3080					3085					3090			
His	Val	Leu	Val	His	His	Thr	Pro	Ala	Ala	Thr	Thr	Ala	Asp	Ala
	3095					3100					3105			
Val	His	Ala	Ala	Thr	His	Glu	Ala	Leu	Arg	Leu	Val	Arg	Ala	Trp
	3110					3115					3120			
Leu	Ala	Asp	Asp	Arg	Phe	Ala	Ala	Ser	Arg	Leu	Val	Phe	Val	Thr
	3125					3130					3135			
Arg	Gly	Ala	Ile	Ala	Thr	Gln	Ser	Asp	Trp	Asp	Leu	Thr	Asp	Leu
	3140					3145					3150			
Thr	His	Ala	Pro	Val	Trp	Gly	Leu	Val	Arg	Thr	Ala	Gln	Ser	Glu
	3155					3160					3165			
Asn	Pro	Asp	Arg	Phe	Val	Leu	Ala	Asp	Leu	Asp	Ala	Asp	Pro	Ala

3170	3175	3180
Ser Thr Asp Ala Leu Ala	Ala Ala Leu Ala Thr	Gly Glu Pro Gln
3185	3190	3195
Leu Ala Val Arg Arg Gly	Thr Val His Ala Pro	Arg Leu Ala Arg
3200	3205	3210
Val Pro Ala Ala Thr Pro	Leu Thr Pro Pro Pro	Gly Glu Ser Ala
3215	3220	3225
Trp Arg Met Asp Ile Glu	Asp Lys Gly Thr Leu	Asp His Leu Thr
3230	3235	3240
Leu Val Pro Ser Pro Glu	Ser Ala Ala Pro Leu	Glu Pro Gly Gln
3245	3250	3255
Val Arg Val Ala Val Arg	Ala Ala Gly Leu Asn	Phe Arg Asp Val
3260	3265	3270
Leu Asn Ala Leu Gly Met	Tyr Pro Gly Asp Pro	Gly Leu Met Gly
3275	3280	3285
Ser Glu Gly Ala Gly Ile	Val Val Glu Thr Gly	Pro Gly Val Thr
3290	3295	3300
Gly Leu Ala Pro Gly Asp	Arg Val Met Gly Met	Leu Pro Gly Ser
3305	3310	3315
Phe Gly Pro Leu Ala Val	Val Asp Arg Arg Met	Ile Ala Pro Met
3320	3325	3330
Pro Glu Gly Trp Thr Phe	Ala Glu Ala Ala Ser	Val Pro Ile Val
3335	3340	3345
Phe Met Thr Ala Tyr Tyr	Ala Leu His Asp Leu	Ala Gly Leu Gln
3350	3355	3360
Gly Gly Glu Ser Leu Leu	Val His Ala Ala Ala	Gly Gly Val Gly
3365	3370	3375
Met Ala Ala Val Gln Leu	Ala Arg His Trp Gly	Ala Asp Val Tyr
3380	3385	3390
Ala Thr Ala Ser Pro Ala	Lys Trp Asp Thr Leu	Arg Gly Leu Gly
3395	3400	3405
Leu Gly Asp Asp Arg Ile	Ala Ser Ser Arg Thr	Leu Asp Phe Glu
3410	3415	3420
Glu Thr Phe Arg Thr Ala	Thr Gly Gly Arg Gly	Val Asp Val Val
3425	3430	3435
Leu Asp Ser Leu Ala Arg	Glu Phe Val Asp Ala	Ser Leu Arg Leu
3440	3445	3450
Leu Pro Arg Gly Gly Arg	Phe Val Glu Met Gly	Lys Thr Asp Val
3455	3460	3465
Arg Ser Pro Gln Asp Val	Ala Asp Ala His Pro	Gly Val Ser Tyr



3470		3475		3480
Gln Ala Phe Asp Leu Thr	Glu Ala Gly Leu Asp	Arg Ile Gln Glu		
3485	3490	3495		
Met Leu Thr Glu Leu Leu	Thr Leu Phe Arg Ser	Gly Ala Leu Arg		
3500	3505	3510		
Pro Val Pro Val Ser Ala	Trp Asp Leu Arg Gln	Ala Pro Glu Ala		
3515	3520	3525		
Phe Arg Tyr Leu Ser Gln	Ala Arg His Val Gly	Lys Ile Val Leu		
3530	3535	3540		
Thr Leu Pro Gly Glu Trp	Asn Ser Gln Gly Thr	Val Leu Ile Thr		
3545	3550	3555		
Gly Gly Thr Gly Thr Leu	Gly Ala Val Val Ala	Arg His Ala Val		
3560	3565	3570		
Thr Thr Arg Gly Ala Arg	Arg Leu Leu Leu Thr	Ser Arg Arg Gly		
3575	3580	3585		
Glu Ala Ala Ala Gly Ala	Ala Glu Leu Ala Ala	Glu Leu Arg Glu		
3590	3595	3600		
Leu Gly Ala Glu Val Thr	Ile Ala Ala Cys Asp	Ala Ala Asp Arg		
3605	3610	3615		
Asp Ala Leu Ala Ala Leu	Ile Glu Ser Ile Pro	Ser Glu His Pro		
3620	3625	3630		
Leu Thr Ala Val Ile His	Thr Ala Gly Val Leu	Asp Asp Gly Val		
3635	3640	3645		
Val Asp Ser Leu Thr Pro	Glu Arg Leu Ser Thr	Val Leu Arg Pro		
3650	3655	3660		
Lys Val Asp Ala Ala Trp	Asn Leu His Glu Leu	Thr Arg His Leu		
3665	3670	3675		
Asp Leu Ala Asp Phe Val	Leu Phe Ser Ser Ala	Ala Gly Thr Phe		
3680	3685	3690		
Gly Gly Ala Gly Gln Ala	Asn Tyr Ala Ala Ala	Asn Val Phe Leu		
3695	3700	3705		
Asp Ala Leu Ala Arg His	Arg His Ala His Gly	Leu Ala Ala Thr		
3710	3715	3720		
Ser Leu Ala Trp Gly Leu	Trp Ala Glu Ala Ser	Gly Met Thr Gly		
3725	3730	3735		
Glu Leu Asp Thr Ala Asp	Lys Asp Arg Met Thr	Arg Ser Gly Val		
3740	3745	3750		
Leu Gly Leu Ser Ser Glu	Glu Gly Val Ala Leu	Leu Asp Thr Ala		
3755	3760	3765		
Arg Leu Thr Gly Asp Ala	Leu Leu Val Pro Met	His Leu Asp Leu		

3770	3775	3780
Ala Pro Leu Arg Arg Thr Asp 3785	Ala Ser Met Val Pro 3790	Ala Leu Leu 3795
Arg Gly Leu Val Arg Ala Pro 3800	Ala Arg Arg Ala Val 3805	Gly Ala Thr 3810
Ala Ala Gly Ala Gly Thr Pro 3815	Leu Val Glu Arg Leu 3820	Val Arg Leu 3825
Pro Glu Asn Glu Arg Asp Pro 3830	Leu Leu Leu Asp Leu 3835	Val Arg Gln 3840
Gln Val Ala Ala Val Leu Gly 3845	His Ala Thr Pro Asp 3850	Ala Val Glu 3855
Pro Thr Arg Ala Phe Lys Asp 3860	Leu Gly Phe Asp Ser 3865	Leu Thr Ala 3870
Val Glu Phe Arg Asn Arg Leu 3875	Gly Ala Thr Ala Gly 3880	Ile Arg Leu 3885
Pro Ala Thr Leu Val Phe Asp 3890	Tyr Pro Thr Pro Thr 3895	Val Leu Ala 3900
Gly Tyr Leu Lys Asp Glu Leu 3905	Leu Gly Ser Glu Ala 3910	Ala Ala Ala 3915
Leu Pro Lys Leu Ala Ala Thr 3920	Ala Val Glu Gly Asp 3925	Asp Pro Ile 3930
Ala Ile Val Ala Met Ser Cys 3935	Arg Phe Pro Gly Asp 3940	Val Arg Thr 3945
Pro Glu Asp Leu Trp Glu Leu 3950	Leu Ala Glu Gly Arg 3955	Asp Gly Ile 3960
Ser Asp Leu Pro Asp Asp Arg 3965	Gly Trp Asp Thr Glu 3970	Ala Leu Tyr 3975
Asp Pro Asp Pro Asp Ser Pro 3980	Gly Thr Ser Tyr Ala 3985	Arg Glu Gly 3990
Gly Phe Phe Tyr Asp Ala His 3995	His Phe Asp Pro Ala 4000	Phe Phe Gly 4005
Ile Asn Pro Arg Glu Ala Leu 4010	Ala Met Asp Pro Gln 4015	Gln Arg Leu 4020
Leu Leu Glu Thr Ser Trp Glu 4025	Ala Phe Glu Arg Ala 4030	Gly Ile Asp 4035
Pro Thr Gly Leu Arg Gly Lys 4040	Gln Val Gly Val Phe 4045	Val Gly Gln 4050
Met His Asn Asp Tyr Val Ser 4055	Arg Leu Asn Thr Val 4060	Pro Glu Gly 4065
Val Glu Gly Tyr Leu Gly Thr 4070	Gly Gly Ser Ser Ser 4075	Ile Ala Ser 4080

4070						4075						4080					
Gly	Arg	Val	Ser	Tyr	Thr	Phe	Asp	Phe	Glu	Gly	Pro	Ala	Val	Thr			
4085						4090					4095						
Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala			
4100						4105					4110						
Ala	Gln	Ala	Leu	Arg	Asn	Gly	Glu	Cys	Thr	Leu	Ala	Leu	Ala	Gly			
4115						4120					4125						
Gly	Val	Thr	Ile	Ile	Thr	Thr	Pro	Asp	Val	Phe	Thr	Glu	Phe	Ser			
4130						4135					4140						
Arg	Gln	Arg	Gly	Leu	Ala	Ser	Asp	Gly	Arg	Cys	Lys	Pro	Phe	Ala			
4145						4150					4155						
Glu	Ala	Ala	Asp	Gly	Thr	Ala	Trp	Gly	Glu	Gly	Val	Gly	Met	Leu			
4160						4165					4170						
Leu	Val	Glu	Arg	Leu	Ser	Asp	Ala	Arg	Arg	Asn	Gly	His	Gln	Val			
4175						4180					4185						
Leu	Ala	Val	Val	Arg	Gly	Thr	Ala	Val	Asn	Gln	Asp	Gly	Ala	Ser			
4190						4195					4200						
Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val	Ile			
4205						4210					4215						
Arg	Gln	Ala	Leu	Ala	Asn	Ala	Gly	Leu	Thr	Ala	Ala	Glu	Val	Asp			
4220						4225					4230						
Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp	Pro	Ile			
4235						4240					4245						
Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Asp	Arg	Pro	Glu			
4250						4255					4260						
Gly	Ser	Pro	Leu	Trp	Leu	Gly	Ser	Ile	Lys	Ser	Asn	Phe	Gly	His			
4265						4270					4275						
Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Ile	Ile	Lys	Met	Val	Gln			
4280						4285					4290						
Ala	Met	His	His	Gly	Val	Leu	Pro	Lys	Thr	Leu	His	Val	Asp	Ala			
4295						4300					4305						
Pro	Ser	Pro	His	Val	Asp	Trp	Ser	Ala	Gly	Ala	Val	Ser	Leu	Leu			
4310						4315					4320						
Thr	Glu	Gln	Met	Ala	Trp	Pro	Glu	Thr	Gly	Arg	Pro	Arg	Arg	Ala			
4325						4330					4335						
Gly	Val	Ser	Ser	Phe	Gly	Met	Ser	Gly	Thr	Asn	Ala	His	Ala	Ile			
4340						4345					4350						
Ile	Glu	Leu	Ala	Pro	Asp	Ala	Ala	Thr	Pro	Ser	Ala	Ala	Arg	Pro			
4355						4360					4365						
Glu	Pro	Ala	Pro	Ala	Ala	Leu	Pro	Trp	Asn	Leu	Ser	Ala	Arg	Thr			

4370	4375	4380
Pro Asp Ala Leu Arg Ala	Gln Gly Glu Arg Leu	Leu Ser His Leu
4385	4390	4395
Glu Thr His Cys Glu Thr	His Pro Glu Thr Val	Leu Ala Asp Ile
4400	4405	4410
Gly His Ser Leu Thr Thr	Gly Arg Ala Leu Phe	Glu His Arg Ala
4415	4420	4425
Thr Val Val Ala Gly Asp	Arg Asp Gly Phe Arg	Ala Gly Leu Ala
4430	4435	4440
Ala Leu Ala Glu Gly Arg	Thr Ala Ala Gly Leu	Ile Gln Gly Ser
4445	4450	4455
Ser Ser Thr Gly Gly Arg	Thr Ala Phe Leu Phe	Thr Gly Gln Gly
4460	4465	4470
Ser Gln Arg Leu Gly Met	Gly Arg Glu Leu Tyr	Glu Ala Tyr Pro
4475	4480	4485
Val Phe Ala Arg Ala Leu	Asp Glu Val Cys Ala	Arg Leu Glu Leu
4490	4495	4500
Pro Leu Pro Leu Lys Asp	Val Leu Phe Gly Thr	Asp Thr Gly Leu
4505	4510	4515
Leu Asn Glu Thr Ala Tyr	Thr Gln Pro Ala Leu	Phe Ala Val Glu
4520	4525	4530
Val Ala Leu Phe Arg Leu	Val Glu Ser Trp Gly	Leu Lys Pro Asp
4535	4540	4545
Phe Leu Ala Gly His Ser	Ile Gly Glu Ile Ala	Ala Ala His Val
4550	4555	4560
Ala Gly Val Leu Ser Leu	Glu Asp Ala Cys Ala	Leu Val Ser Ala
4565	4570	4575
Arg Gly Arg Leu Met Gly	Ala Leu Pro Gly Gly	Gly Val Met Ile
4580	4585	4590
Ala Val Gln Ala Ser Glu	Gly Glu Val Leu Pro	Leu Leu Thr Asp
4595	4600	4605
Arg Val Ser Ile Ala Ala	Ile Asn Gly Pro Gln	Ser Val Val Ile
4610	4615	4620
Ala Gly Asp Glu Ala Asp	Ala Val Ala Ile Val	Glu Ser Phe Ser
4625	4630	4635
Asp Arg Lys Ser Lys Arg	Leu Thr Val Ser His	Ala Phe His Ser
4640	4645	4650
Pro His Met Asp Gly Met	Leu Asp Asp Phe Arg	Ala Val Ala Glu
4655	4660	4665
Gly Leu Ser Tyr Gly Ala	Pro Arg Ile Pro Val	Val Ser Asn Leu

4670	4675	4680
Thr Gly Ala Leu Val Ser Asp Glu Met Gly Ser Ala Asp Phe Trp 4685 4690 4695		
Val Arg His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg 4700 4705 4710		
Ala Leu Glu Ala Ala Gly Val Thr Thr Tyr Ile Glu Leu Gly Pro 4715 4720 4725		
Asp Gly Ile Leu Ser Ala Met Ala Gln Glu Cys Ile Thr Gly Glu 4730 4735 4740		
Gly Ala Ala Phe Ala Pro Val Leu Arg Ala Gly Arg Asp Glu Ala 4745 4750 4755		
Glu Thr Val Leu Ser Ala Leu Ala Ala Ala His Val Arg Gly Val 4760 4765 4770		
Pro Val Asp Trp Gln Ala Phe Tyr Ala Pro Ala Gly Ala Gln Arg 4775 4780 4785		
Val Pro Leu Pro Thr Tyr Ala Phe Gln Arg Ser Val Tyr Trp Leu 4790 4795 4800		
Asp Ala Gly Arg Ala Gln Gly Asp Ile Ala Ser Ala Gly Leu Gly 4805 4810 4815		
Ala Thr Asp His Pro Leu Leu Ser Ala Ala Val Glu Leu Pro Asp 4820 4825 4830		
Ser Asp Gly Phe Leu Phe Thr Gly Arg Leu Ser Leu Ala Thr His 4835 4840 4845		
Pro Trp Leu Ala Asp His Ala Val Leu Gly Ser Val Leu Leu Pro 4850 4855 4860		
Gly Thr Ala Phe Val Glu Leu Ala Leu Arg Ala Gly Asp Gln Val 4865 4870 4875		
Gly Cys Asp Leu Ile Asp Glu Leu Thr Leu Glu Ala Pro Leu Val 4880 4885 4890		
Leu Pro Pro His Gly Gly Val Gln Leu Arg Leu Ala Val Ala Ala 4895 4900 4905		
Ala Asp Ala Thr Gly Arg Arg Thr Leu Ala Phe His Ser Arg Ser 4910 4915 4920		
Glu Asp Ala Asp Ala Gly Thr Pro Trp Thr Arg His Ala Ser Gly 4925 4930 4935		
Val Leu Ala Val Gly Ala Glu Arg Thr Pro Gln Ser Leu Thr Glu 4940 4945 4950		
Trp Pro Pro Thr Gly Ala Glu Ser Val Pro Val Asp Gly Leu Tyr 4955 4960 4965		
Glu Gly Leu Ala Glu Ser Gly Phe Gly Tyr Gly Pro Val Phe Gln		

4970	4975	4980
Gly Leu Arg Ala Ala Trp 4985	Arg Arg Asp Gly Glu 4990	Tyr Tyr Ala Glu 4995
Val Ala Leu Pro Glu Gly 5000	Thr Glu Asp Glu Ala 5005	Gly Arg Phe Gly 5010
Leu His Pro Ala Leu Leu 5015	Asp Ala Ala Leu His 5020	Ala Leu Gly Leu 5025
Gly Ser Thr Asp Thr Glu 5030	Gly Gly Glu Gly Arg 5035	Leu Pro Phe Ser 5040
Trp Ser Gly Val His Leu 5045	His Ala Val Gly Ala 5050	Ser Ala Leu Arg 5055
Val Arg Leu Thr Thr Ser 5060	Arg Ser Gly Glu Val 5065	Ala Leu Thr Ile 5070
Ala Asp Ala Ala Gly Glu 5075	Pro Val Ala Thr Val 5080	Ala Gly Leu Ala 5085
Leu Arg Ala Val Ser Arg 5090	Glu Gln Leu Ser Thr 5095	Ala Arg Asp Leu 5100
Thr Arg Asp Ala Leu Phe 5105	Arg Val Asp Trp Thr 5110	Ala Leu Pro Ala 5115
Gly Gly Ala Val Gly Ser 5120	Leu Asp Asp Trp Met 5125	Leu Leu Gly Ala 5130
Gly Ser Gln Val Tyr Ala 5135	Asp Leu Ala Gly Leu 5140	Gly Val Ala Val 5145
Ala Glu Gly Gly Gly Ile 5150	Pro Ala Ala Leu Val 5155	Val Pro Val Ser 5160
Glu Pro Asp Ala Glu Ser 5165	Ala Ala Gly Gly Val 5170	Ala Gly Thr Val 5175
His Ala Ala Val Glu Arg 5180	Ala Leu Ser Leu Val 5185	Gln Glu Trp Leu 5190
Ser Asp Glu Arg Phe Ala 5195	Asp Ala Arg Leu Val 5200	Phe Leu Thr Arg 5205
Gly Ala Val Ala Ala Arg 5210	Ala Gly Asp Thr Val 5215	Pro Gly Leu Val 5220
Gln Ala Ala Val Trp Gly 5225	Leu Val Arg Ser Ala 5230	Gln Ser Glu Asn 5235
Pro Gly Arg Phe Ala Leu 5240	Ile Asp Val Asp Gly 5245	Asp Gly Asp Gly 5250
Asp Gly Glu Val Asp Gly 5255	Asp Val Leu Ser Ala 5260	Ala Leu Ala Thr 5265
Gly Glu Pro Glu Leu Ala 5270	Val Arg Glu Gly Ala 5275	Leu Leu Val Pro 5280

5270	5275	5280
Arg Leu Ala Arg Ala Ala	Val Val Glu Gly Ala	Gly Arg Glu Leu
5285	5290	5295
Asp Val Asp Gly Thr Val	Leu Val Thr Gly Ala	Ser Gly Thr Leu
5300	5305	5310
Gly Gly Leu Phe Ala Arg	His Leu Val Val Glu	Arg Gly Val Arg
5315	5320	5325
Arg Leu Leu Leu Val Ser	Arg Arg Gly Glu Ala	Ala Glu Gly Ala
5330	5335	5340
Ala Glu Leu Gly Ala Glu	Leu Thr Glu Leu Gly	Ala Asp Val Arg
5345	5350	5355
Trp Ala Ala Cys Asp Val	Ala Asp Arg Asp Ala	Leu Glu Ala Val
5360	5365	5370
Leu Ala Gly Ile Pro Ala	Glu Tyr Pro Leu Ser	Gly Val Val His
5375	5380	5385
Thr Ala Gly Val Leu Asp	Asp Gly Val Val Ser	Ser Leu Thr Pro
5390	5395	5400
Glu Arg Leu Ser Ala Val	Leu Arg Pro Lys Val	Asp Ala Ala Trp
5405	5410	5415
Asn Leu His Glu Leu Thr	Arg Gly Leu Asp Leu	Ser Leu Phe Val
5420	5425	5430
Leu Phe Ser Ser Ala Ala	Gly Val Phe Gly Gly	Ala Gly Gln Ala
5435	5440	5445
Asn Tyr Ala Ala Ala Asn	Val Phe Leu Asp Ala	Leu Ala Gln His
5450	5455	5460
Arg Arg Ala Gln Gly Leu	Ala Ala Thr Ser Leu	Ala Trp Gly Leu
5465	5470	5475
Trp Ala Gly Val Gly Gly	Met Gly Gly Glu Leu	Thr Glu Ser Asp
5480	5485	5490
Arg Glu Arg Ile Asn Arg	Gly Gly Ile Thr Ala	Leu Glu Pro Glu
5495	5500	5505
Thr Gly Leu Ala Leu Phe	Asp Ala Ala Gln Arg	Thr Thr Asp Ala
5510	5515	5520
Leu Leu Val Pro Leu Pro	Leu Asp Leu Ala Ala	Leu Arg Val Gln
5525	5530	5535
Ala Gly Ser Gly Met Leu	Pro Asp Leu Leu Arg	Gly Leu Val Arg
5540	5545	5550
Val Pro Val Arg Arg Ala	Ala Gly Gln Gly Ser	Ala Ala Gly Gly
5555	5560	5565
Gly Ser Val Leu Arg Thr	Arg Leu Ala Ala Met	Pro Ala Asp Glu

5570	5575	5580
Arg Asp Ala Ala Leu Leu	Asp Leu Val Arg Ala	Glu Val Ala Ala
5585	5590	5595
Val Leu Gly His Ala Ser	Thr Asp Glu Val Pro	Ala Asp Arg Ala
5600	5605	5610
Phe Lys Glu Leu Gly Phe	Asp Ser Leu Thr Ser	Val Glu Leu Arg
5615	5620	5625
Asn Arg Leu Gly Ala Thr	Thr Gly Glu Arg Leu	Ser Ala Thr Leu
5630	5635	5640
Val Phe Asp Tyr Pro Thr	Pro His Ala Leu Ala	Glu Phe Leu Arg
5645	5650	5655
Thr Glu Val Leu Gly Leu	Asp Glu Pro Thr Asp	Thr Ala Thr Thr
5660	5665	5670
Ala Pro Thr His Leu Gly	Thr Ser Leu Asp Asp	Asp Pro Ile Ala
5675	5680	5685
Ile Val Gly Met Ser Cys	Arg Tyr Pro Gly Gly	Val Glu Thr Pro
5690	5695	5700
Glu Asp Leu Trp Arg Leu	Val Val Gly Gly Gly	Asp Ala Ile Ser
5705	5710	5715
Glu Phe Pro Gln Gly Arg	Gly Trp Asp Leu Glu	Ser Leu Tyr Asp
5720	5725	5730
Pro Asp Pro Asp Gly Lys	Gly Thr Ser Tyr Thr	Arg Ser Gly Gly
5735	5740	5745
Phe Leu His Asp Ala Gly	Arg Phe Asp Pro Ala	Phe Phe Gly Ile
5750	5755	5760
Ser Pro Arg Glu Ala Val	Ala Met Asp Pro Gln	Gln Arg Leu Leu
5765	5770	5775
Leu Glu Thr Ser Trp Glu	Ala Phe Glu Arg Ala	Gly Ile Asp Pro
5780	5785	5790
Ala Ser Met Arg Gly Ser	Arg Thr Gly Val Phe	Ala Gly Ile Met
5795	5800	5805
Tyr His Asp Tyr Ala Thr	Arg Ile Thr Ser Val	Pro Asp Gly Val
5810	5815	5820
Glu Gly Tyr Leu Gly Thr	Gly Asn Ser Gly Ser	Ile Ala Ser Gly
5825	5830	5835
Arg Val Ser Tyr Ala Phe	Gly Leu Glu Gly Pro	Ala Val Thr Val
5840	5845	5850
Asp Thr Ala Cys Ser Ser	Ser Leu Val Ala Leu	His Trp Ala Ile
5855	5860	5865
Gln Ala Leu Arg Asn Gly	Glu Cys Thr Met Ala	Leu Ala Gly Gly



5870				5875				5880			
Val Thr	Val Met Ser Thr	Pro Gly Thr Phe Thr	Glu Phe Ser Arg								
5885		5890	5895								
Gln Arg	Gly Leu Ala Ala	Asp Gly Arg Ile Lys	Ser Phe Ala Ala								
5900		5905	5910								
Ala Ala	Asp Gly Thr Ser	Trp Ala Glu Gly Ala	Gly Met Leu Leu								
5915		5920	5925								
Val Glu	Arg Leu Ser Glu	Ala Arg Ala Lys Gly	His Pro Val Leu								
5930		5935	5940								
Ala Ile	Val Arg Gly Ser	Ala Ile Asn Gln Asp	Gly Ala Ser Asn								
5945		5950	5955								
Gly Leu	Thr Ala Pro Asn	Gly Pro Ser Gln Gln	Arg Val Ile Arg								
5960		5965	5970								
Gln Ala	Leu Ala Gly Ala	Arg Leu Thr Ser Asp	Gln Ile Asp Val								
5975		5980	5985								
Val Glu	Ala His Gly Thr	Gly Thr Thr Leu Gly	Asp Pro Ile Glu								
5990		5995	6000								
Ala Gln	Ala Leu Leu Ala	Thr Tyr Gly Arg Glu	Arg Glu Ala Asp								
6005		6010	6015								
Gln Pro	Leu Trp Leu Gly	Ser Ile Lys Ser Asn	Met Gly His Thr								
6020		6025	6030								
Gln Ala	Ala Ala Gly Val	Ala Gly Ile Ile Lys	Met Ile Met Ala								
6035		6040	6045								
Ile Arg	His Gly Val Leu	Pro Lys Thr Leu His	Val Asp Glu Pro								
6050		6055	6060								
Thr Pro	His Val Asp Trp	Glu Ala Gly Ala Val	Ser Leu Leu Thr								
6065		6070	6075								
Glu Ser	Val Pro Trp Pro	Glu Thr Gly Arg Pro	Arg Arg Ala Gly								
6080		6085	6090								
Val Ser	Ser Phe Gly Ile	Ser Gly Thr Asn Ala	His Thr Ile Ile								
6095		6100	6105								
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Gln Thr	Pro Gly Ala Gly	Ser Arg Val Leu Pro	Phe Val Leu Ser								
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Asp Val	Ala Tyr Ser Leu	Ala Thr Arg Arg Ala	Val Phe Asp His								

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Gly Ser Gln Arg Leu Gly Met Gly Arg Glu Leu Tyr Glu Thr Tyr 6230 6235 6240		
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Gly Val Leu Ser Leu Asp Asp Ala Cys Ala Leu Val Glu Ala Arg 6320 6325 6330		
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His Met Asp Gly Met Leu Ala Gly Phe Arg Lys Val Ala Glu Ser 6410 6415 6420		
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Gly Ala Leu Val Thr Asp Glu Met Gly Ser Ala Asp Phe Trp Val 6440 6445 6450		
Arg His Val Arg Glu Ala Val Arg Phe Leu Asp Gly Ile Arg Thr 6455 6460 6465		
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 gacgactact cggctctattc gcagatcgcc ttctcgggtga attcgatggc tatggccgac 300

cgggcggtgg acgcgctcgg catctctccc accgtctgcg ccggcccagag tttcggccag 360  
 aaggccgcct ccgctttcgt cgggtcgtg cccttcgcgg acgtcgtccg gtcaccgcg 420  
 gagctggccc gctgcgagga ggagtacttc gccgacgcgt accaggacgt cgtcacgcac 480  
 tgcttcgtcc gcaccccgca ggaccggctg gacgagatcc tggccggctt cgacgaccgc 540  
 ggtgcctggg acgacatctc cgggcggtg gacgccgctt tccacatggg gtccgtacag 600  
 gagaaggagc tggacgggct gaaggcgggc atcagcgcgg tcggcggcta ctccatgtac 660  
 tcgatgcgcc cgcccgtaga cgcgggcgcc ttctcggcgc tgcgccgcaa ggcggaggaa 720  
 gaggtcttcg ccgcgtacga actggccgac cccaccctgc ccgtgggtcaa cgaccaggac 780  
 ggcgggggtcg tccgggacgc cgccgggatg cgcacgatga tgctggacac cttcgaccgg 840  
 cccgtccact ggccgggctg ggtggagtcc ctcaaggggc tcggcgtggg cacggtgtgc 900  
 gtgaccgggc ccgacaacct cttccaccgc ctcgacctca ccaaggacag cttcgaggtc 960  
 gtgacggtgg ggctgccgaa gaagcgctcc cgcgagcgtg agaagcgcggt cgctga 1017

<210> 41  
 <211> 283  
 <212> PRT  
 <213> Streptomyces aizunensis  
 <400> 41

Met Thr Ala Thr Leu Thr Ala Pro Asp Pro Val Thr Asp Phe Pro Ala  
 1 5 10 15  
 Glu Leu Arg Pro Ala Arg Thr Asp Val Arg Thr Ala Thr Arg Thr Phe  
 20 25 30  
 Phe Phe Ile Leu Trp Arg Asp Ile Phe Val Thr Gly Arg Glu Leu Gly  
 35 40 45  
 Pro Phe Leu Ala Gln Val Leu Val Glu Pro Phe Phe Ile Leu Phe Val  
 50 55 60  
 Phe Gly Lys Val Leu Gly Glu Leu Gly Tyr Thr Gly Gly Gly Phe Gln  
 65 70 75 80  
 Gln Ile Leu Leu Pro Gly Val Val Ala Leu Asn Ser Phe Leu Val Ser  
 85 90 95  
 Leu Gln Asn Thr Ala Leu Pro Leu Val Ile Asp Phe Ser Trp Thr Lys  
 100 105 110  
 Glu Ile Glu Asp Arg Leu Leu Ala Pro Ile Pro Thr Ser Leu Val Ala  
 115 120 125  
 Val Glu Lys Leu Val Phe Gly Ala Leu Arg Gly Ile Ile Ala Ser Leu  
 130 135 140



Val Met Ile Pro Val Gly Phe Leu Ile Leu Asp Asp Val Ser Trp Pro  
145 150 155 160

Met Asp Ser Phe Leu Pro Thr Leu Gly Val Leu Leu Thr Gly Ala Leu  
165 170 175

Ala Gly Ser Thr Val Gly Leu Thr Ile Gly Thr Leu Ala Pro Pro Arg  
180 185 190

His Ile Ser Val Ile Phe Ala Val Thr Leu Thr Pro Leu Met Phe Thr  
195 200 205

Gly Cys Thr Gln Phe Pro Trp His Ser Leu Ala Asp Ile Arg Trp Phe  
210 215 220

Gln Val Leu Cys Ala Ile Asn Pro Leu Thr Tyr Val Ser Glu Gly Ile  
225 230 235 240

Arg Ala Leu Leu Leu Pro Pro Gly Gly Pro Gly Ser Ile Pro Leu Trp  
245 250 255

Ile Asp Leu Leu Ala Leu Ser Gly Ala Ile Val Val Phe Gly Leu Ile  
260 265 270

Gly Ile Lys Gly Phe His Arg Arg Ala Gln Asp  
275 280

<210> 42  
<211> 852  
<212> DNA  
<213> Streptomyces aizunensis

<400> 42  
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gcgcgcaccg acgtgcgcac cgcgaccgc acgttcttct tcatcctgtg gcgggacatc 120  
ttcgtcaccg gccgcgaact gggcccgttc ctgcgccagg tgctcgtgga accgttcttc 180  
atcctgttcg tcttcggcaa ggtcctcggc gaactcgggt acaccggcgg cgggttccag 240  
cagatcctgc tcccgggcgt ggtcgcgctc aacagcttcc tggtcagcct gcagaacacc 300  
gcgctgcccc tggatcatga cttctcctgg accaaggaga tcgaggaccg gtcctcgcg 360  
cccatcccca ccagcctggg ggccgtcgag aagctgggtc tcggggcgct gcgcggcatc 420  
atgcctcac tggatgatgat cccgctcggc ttctgatcc tcgacgacgt gtcctggccg 480  
atggacagct tcctgcccac gctgggcgtg ctgctgacgg gcgcgctggc gggcagcacg 540  
gtgggtctga ccatcggcac gctggccccg ccgcggcaca tcagcgtcat cttcgccgtg 600  
acgctgacct cgctgatgtt caccggctgc acccagttcc cctggcacag cctggcggac 660  
atccgctggg tccaggtgct gtgcgccatc aaccgctga cctacgtcag cgaggggatc 720  
cgcgccctgc tgctgccgcc gggcggcccc ggctcgattc cgctgtggat cgatctgctc 780  
gccctgagcg gggcgatcgt ggtcttcggg ctgatcggca tcaaggggtt ccaccgcagg 840

&lt;210&gt; 43

&lt;211&gt; 329

&lt;212&gt; PRT

&lt;213&gt; Streptomyces aizunensis

&lt;400&gt; 43

Val Asp Ser Ala Val Val Val Asp Gly Leu Val Lys Lys Tyr Arg Ser  
1 5 10 15

Arg Asp Arg Pro Ala Val Asp Asp Leu Ser Phe Ser Val Arg Arg Gly  
20 25 30

Glu Val Phe Gly Phe Leu Gly Pro Asn Gly Ala Gly Lys Thr Thr Thr  
35 40 45

Ile Gly Ile Leu Thr Thr Arg Val Ala Pro Thr Ala Gly Arg Ala Phe  
50 55 60

Val Gln Gly Val Asp Val Val Ala His Pro Ala Gln Ala Arg Arg Ala  
65 70 75 80

Phe Ala Val Val Pro Gln Arg Asn Asn Leu Asp Arg Ser Leu Thr Leu  
85 90 95

Arg Gln Asn Leu Thr Phe His Ala Gly Tyr His Gly Met Ser Arg Ser  
100 105 110

Glu Arg Gly Arg Leu Ala Asp Glu Cys Leu Glu Trp Val Gly Leu Ala  
115 120 125

Asp Arg Gly Lys Ala Arg Gly Asp Glu Leu Ser Gly Gly Gln Ala Gln  
130 135 140

Arg Val Met Ile Ala Arg Ala Leu Met His Arg Pro Asp Val Leu Phe  
145 150 155 160

Leu Asp Glu Pro Ala Thr Gly Leu Asp Pro Gln Ala Arg Leu Phe Ile  
165 170 175

His Glu Arg Val Ala Glu Leu Ser Lys Arg Gly Val Thr Thr Val Leu  
180 185 190

Thr Thr His Asp Met Asp Glu Ala Ala Lys Leu Cys Asp Arg Val Gly  
195 200 205

Ile Val Asp His Gly Arg Leu Leu Ala Leu Asp Thr Pro Gln Ala Leu  
210 215 220

Thr Arg Ser Leu Ser Ser Thr Ala Leu Thr Leu Thr Val Gln Pro Ala  
225 230 235 240

Gly His Asp Ala Glu Ser Val Val Arg Leu Leu Glu Arg Ile Glu Thr  
245 250 255

Val Glu Arg Val Glu Leu Ala His Gln Glu His Ala Lys Glu Gln Gly

	260		265		270										
Gly	Ala	Pro	Ala	Pro	Val	Arg	Leu	Arg	Leu	Tyr	Ser	Asp	Ala	Pro	Ser
	275						280					285			
Gly	Ala	Val	Leu	Pro	Thr	Ala	Ile	Thr	Ala	Leu	Thr	Glu	Ala	Ser	His
	290					295					300				
Asp	Ile	Lys	Asp	Val	Ser	Val	Gly	Thr	Ala	Thr	Leu	Glu	Asp	Val	Phe
305					310					315					320
Ile	Lys	Leu	Thr	Gly	Arg	Glu	Leu	Arg							
				325											

<210> 44  
 <211> 990  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 44  
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 gcggtggacg acctgagctt ctcggtccgc aggggcgagg tcttcggatt cctcggcccg 120  
 aacggggcgg gcaagacgac gaccatcggc atcctcacca cccgcgtggc cccacggcg 180  
 gggcgagcgt tcgtccaggg cgtcgacgtc gtggcccacc ccgcccaggc gcgcccggcc 240  
 ttgcgcgtcg taccgcagcg caacaacctc gaccgggtcg tgacctccg gcagaacctg 300  
 accttccacg ccggctatca cggcatgagc cgctccgaac gcggacggct cgccgacgag 360  
 tgcttgaggt ggggtgggtct cgccgaccgg ggcaaggccc gcggcgacga actctccggc 420  
 ggccaggccc agcgcgtgat gatcgcccgg gccctgatgc accgccccga cgtgctcttc 480  
 ctcgacgagc ccgccaccgg actcgatccg caggcacggc tgttcatcca cgagcgcgtg 540  
 gccgagctga gcaagcgcgg ggtgaccacc gtgctgacca cgcacgacat ggacgaagcc 600  
 gccaaactct gcgaccgct cggcatcgtc gaccacggcc gactgctggc cctcgacacc 660  
 ccgcaggcgc tgaccggag cctgagcagc accgccctca ccctaccgt ccagcccgcg 720  
 gggcacgacg ccgagagcgt cgtacgcctg ctggagcgga tcgagacggt cgagcgggtc 780  
 gagctggcac accaggaaca cgccaaggag caggggcgcg cgcccgcgc ggtacggctc 840  
 cgctctaca gcgacgcgcc gtccggcgcg gtgctgccga ccgccatcac ggccctgacg 900  
 gaagcgagtc acgacatcaa ggacgtgagc gtcggaaccg cgaccctgga ggacgtcttc 960  
 atcaagctca ccggccggga gctgcatga 990

<210> 45  
 <211> 317  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 45

Val	Ser	Ala	Gly	Phe	Gly	Val	Glu	Pro	Gly	Ser	Leu	Arg	Trp	Met	Val	1	5	10	15
Ile	Gly	Ala	Thr	Gly	Met	Leu	Gly	Gly	Glu	Val	Ala	Ala	Gln	Leu	Thr	20	25	30	
Ala	Arg	Gly	Ala	Asp	Pro	Val	Gly	Val	Gly	Ser	Ala	Asp	Leu	Asp	Leu	35	40	45	
Thr	Asp	Pro	Gln	Ala	Val	Ala	Ala	Ala	Val	Ala	Asp	Gly	Gly	Pro	Asp	50	55	60	
Val	Val	Val	Asn	Cys	Ala	Ala	Trp	Thr	Ala	Val	Asp	Leu	Ala	Glu	Thr	65	70	75	80
Glu	Glu	Glu	Ala	Ala	Leu	Ala	Val	Asn	Gly	Thr	Gly	Ala	Gly	His	Leu	85	90	95	
Ala	Arg	Ala	Cys	Ala	Ala	Thr	Gly	Ser	Arg	Leu	Leu	His	Val	Ser	Thr	100	105	110	
Asp	Tyr	Val	Phe	Arg	Gly	Ala	Pro	Ala	Asp	Ala	Gly	His	Pro	Tyr	Ala	115	120	125	
Glu	Asp	Ala	Glu	Pro	Asp	Pro	Ala	Thr	Ala	Tyr	Gly	Arg	Thr	Lys	Leu	130	135	140	
Val	Gly	Glu	Arg	Ala	Val	Leu	Ala	Glu	Leu	Pro	Ala	Thr	Ala	Ala	Val	145	150	155	160
Val	Arg	Thr	Ser	Trp	Leu	Tyr	Gly	Arg	Asp	Asn	Gly	Gly	Phe	Val	His	165	170	175	
Thr	Met	Ala	Arg	Leu	Ala	Arg	Glu	Pro	Gly	Arg	Thr	Val	Asp	Val	Val	180	185	190	
Asp	Asp	Gln	His	Gly	Gln	Pro	Ser	Trp	Thr	Pro	Asp	Val	Ala	Ala	Arg	195	200	205	
Ile	Ile	Glu	Leu	Ala	Ala	Leu	Pro	Ala	Asp	Arg	Ala	His	Gly	Val	Phe	210	215	220	
His	Ala	Thr	Gly	Gly	Gly	Arg	Thr	Thr	Trp	Tyr	Asp	Leu	Ala	Arg	Glu	225	230	235	240
Val	Phe	Arg	Leu	Thr	Gly	Gln	Asp	Pro	Asp	Arg	Val	Arg	Arg	Ile	Asp	245	250	255	
Ser	Ser	Gly	Leu	Arg	Arg	Ala	Ala	Val	Arg	Pro	Ala	Trp	Ser	Val	Leu	260	265	270	
Gly	His	Asp	Arg	Trp	Ala	Ala	Thr	Gly	Leu	Ala	Pro	Met	Arg	His	Trp	275	280	285	
Arg	Thr	Ala	Leu	Ala	Asp	Ala	Leu	Met	Gly	Asp	Pro	Val	Gly	Asp	Arg	290	295	300	
Leu	Pro	Glu	Ser	Val	Asn	Ser	Pro	Gly	Pro	Lys	Gly	Cys							

305

310

315

&lt;210&gt; 46

&lt;211&gt; 954

&lt;212&gt; DNA

<213> *Streptomyces aizunensis*

&lt;400&gt; 46

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ggcatgctcg gcggcggaagt ggccgcccag ctcacggccc ggggcgccga cccgggtgggg      120
gtcggcagtg cggatctgga cctcaccgac ccgcaggcgg tcgccgcggc cgtggccgac      180
ggcggccccc atgtcgtcgt caactgcgcc gcctggaccg ccgtggacct ggccgagacc      240
gaggaggagg cggccctcgc cgtcaacggg acgggagcgg gccacctcgc ccgggcctgc      300
gccgccaccg gcagccggct cctccacgtc tccaccgact acgtcttccg aggtgccccg      360
gccgatgccg gacacccta tgccgaggac gccgaacccg accccgccac cgcgtacgga      420
cgcaccaagc tcgtcggcga gcgcgccgtc ctcgccgaac tccccgccac cgctgccgtg      480
gtgcgcacgt cctggctgta cggacgcgac aacggcggct tcgtgcacac catggcccgg      540
ctcgcgcgcg agccgggacg caccgtggac gtggtcgacg accagcacgg acagccgagc      600
tggaaccccc atgtcgcggc ccggatcatc gagctcgccg cctgcccgc cgaccgggcg      660
cacggcgtct tccatgccac cggcgggggc cgcaccacct ggtacgacct ggcccgcgag      720
gtgttcgggc tgaccggcca ggacccggac cgggtccggc gcatcgacag ctccgggctg      780
cgacgggchg cggtcgcccc ggcatggagc gttctggggc atgaccgctg ggccgccacg      840
gggctcgccc cgatgcgtca ctggcgcacg gccctcgchg acgccctcat gggcgacccc      900
gtgggcgacc gacttcccga gagtgtgaac tccccgggcc cgaaaggctg ttga      954

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&lt;210&gt; 47

&lt;211&gt; 204

&lt;212&gt; PRT

<213> *Streptomyces aizunensis*

&lt;400&gt; 47

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Val Lys Ser Leu Ser Ile Glu Gly Ala Trp Leu Tyr Glu Pro Leu Leu
1           5           10           15

His Asp Asp Glu Arg Gly Thr Phe Leu Glu Val Phe Gln Ser Gln Ala
          20           25           30

Phe Glu Leu Ala Thr Gly Arg Arg Leu Glu Leu Ala Gln Val Asn Cys
          35           40           45

Ser Val Ser Arg Arg Gly Val Val Arg Gly Val His Phe Ala Asp Leu
          50           55           60

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Pro Pro Gly Gln Ala Lys Tyr Val Thr Cys Val Arg Gly Ala Val Arg  
 65 70 75 80  
 Asp Val Ile Val Asp Leu Arg Thr Gly Ser Pro Thr Tyr Arg Ala Trp  
 85 90 95  
 Glu Ala Val Glu Leu Asp Asp Arg Asp Arg Arg Ala Val Phe Leu Ser  
 100 105 110  
 Glu Gly Leu Gly His Ala Phe Gln Ala Ile Thr Asp Asp Ala Thr Val  
 115 120 125  
 Val Tyr Leu Thr Thr Ser Gly Tyr Ala Pro Gly Arg Glu His Gly Val  
 130 135 140  
 His Pro Leu Asp Pro Glu Leu Gly Ile Thr Trp Leu Pro Gly Met Glu  
 145 150 155 160  
 Pro Leu Leu Ser Pro Lys Asp Ala Val Ala Pro Thr Leu Ala Val Ala  
 165 170 175  
 Glu Ala Gln Gly Leu Leu Pro Ala Tyr Glu Asp Cys Val Arg Tyr Val  
 180 185 190  
 Ser Ser Leu Ala Thr Pro Leu Ser Glu Glu Thr Pro  
 195 200

<210> 48  
 <211> 615  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 48  
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 ctcgaactgg cccaggtcaa ctgctccgtg tcccgccgcg gcgtcgtgcg cggcgtccac 180  
 ttcgccgact taccgcccgg ccaggccaag tacgtcacct gcgtacgcgg cgcggtgcmc 240  
 gatgtgatcg tggacctgcm caccggctcg cccacctacc gcgcctggga ggccgtcgaa 300  
 ctcgacgacc gcgaccggcg ggcggtcttc ctctccgagg gcctcggcca cgccttcag 360  
 gcgatcaccg acgacgccac cgtcgtctac ctgaccacct cgggctacgc ccccgccgt 420  
 gagcacggcg tccacccgct cgaccggag ctgggcatca cctggcttcc cggcatggaa 480  
 ccgctgctgt ccccgaaagg cgctgtcgcc cccacctctg cgggtggcca ggcccagggt 540  
 ctgctgcccc cgtacgagga ctgcgtacgg tacgtgtcct cgctcgccac accactcagc 600  
 gaggagaccc cgtga 615

<210> 49  
 <211> 328  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 49

Val	Ala	Asn	Lys	Pro	Ile	Leu	Phe	Tyr	Val	Leu	Glu	Gly	Ile	Ala	Asp	
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Ala	Gly	Val	Thr	Asp	Val	Gly	Ile	Ile	Val	Gly	Asp	Thr	Ala	Asp	Glu	
			20					25					30			
Ile	Arg	Ala	Ala	Val	Gly	Asp	Gly	Ser	Arg	Phe	Gly	Ile	Ser	Val	Thr	
		35					40					45				
Tyr	Ile	Pro	Gln	His	Gln	Pro	Leu	Gly	Leu	Ala	His	Ala	Val	Arg	Ile	
	50					55					60					
Ala	Arg	Asp	Trp	Leu	Gly	Glu	Asp	Asp	Phe	Val	Met	Tyr	Leu	Gly	Asp	
65					70					75					80	
Asn	Phe	Leu	Leu	Gly	Gly	Ile	Ser	Glu	Gln	Leu	Glu	Glu	Phe	Arg	Thr	
				85					90					95		
Arg	Arg	Pro	Ala	Ala	Gln	Ile	Met	Leu	Thr	Arg	Val	Pro	Asp	Pro	Ser	
			100					105					110			
Ala	Phe	Gly	Val	Val	Thr	Leu	Asp	Glu	Ala	Gly	Arg	Val	Thr	Gly	Leu	
		115					120					125				
Glu	Glu	Lys	Pro	Lys	Phe	Pro	Lys	Ser	Asp	Leu	Ala	Leu	Val	Gly	Val	
	130					135					140					
Tyr	Phe	Phe	Thr	Ala	Ala	Val	His	Asp	Ala	Val	Asp	Ala	Ile	Gln	Pro	
145					150					155					160	
Ser	Ala	Arg	Gly	Glu	Leu	Glu	Ile	Thr	Glu	Ala	Leu	Gln	Trp	Leu	Leu	
				165					170					175		
Asp	Lys	Gly	Leu	Gly	Ile	Ala	Ser	Ser	Thr	Val	Asn	Gly	Tyr	Trp	Lys	
			180					185					190			
Asp	Thr	Gly	Asn	Ala	Thr	Asp	Met	Leu	Glu	Val	Asn	Arg	Thr	Val	Leu	
		195					200					205				
Asp	Arg	Leu	Thr	Pro	Tyr	Cys	Asp	Gly	Ser	Val	Asp	Gly	Glu	Ser	Glu	
	210					215					220					
Leu	Val	Gly	Arg	Val	Val	Val	Glu	Asp	Gly	Ala	Val	Ile	Thr	Arg	Ser	
225					230					235					240	
Arg	Ile	Val	Gly	Pro	Ala	Ile	Ile	Gly	Arg	Gly	Thr	Arg	Val	Glu	Gly	
				245					250					255		
Ser	Tyr	Ile	Gly	Pro	Phe	Thr	Ser	Val	Gly	Ala	Asp	Cys	Val	Val	Val	
			260					265					270			
Asp	Ser	Glu	Ile	Glu	Tyr	Ser	Ile	Val	Leu	Ala	Gly	Ala	Ala	Ile	Asp	
		275					280					285				
Gly	Val	Gly	Arg	Ile	Glu	Ala	Ser	Met	Ile	Gly	Arg	Gln	Ala	Gln	Val	
	290					295					300					

Thr Pro Ala Pro Arg Thr Pro Gln Ala His Arg Leu Ile Leu Gly Asp  
 305 310 315 320

His Ser Lys Val Gln Ile Arg Ser  
 325

<210> 50  
 <211> 987  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 50  
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 gatgtcggca tcatcgtcgg cgacacggcc gacgagatca gggcggccgt cggcgacggc 120  
 tcccgtttcg gcatcagcgt cacctacatc cgcgagcacc agccgctcgg cctggcccac 180  
 gccgtgcgca tcgcacggga ctggctcggc gaggacgact tcgtgatgta cctgggcgac 240  
 aacttctctgc tcggcgggat cagcgagcag ctggaggagt tccgcacccg gcggcccgcc 300  
 gcgcagatca tgctcaccg ggtccccgat ccttcgcct tcggcgctgt caccctcgac 360  
 gaggcgggcc gggtcaccg cctggaggag aagccgaagt tccccaagag cgatctcgcg 420  
 ctggctcggcg tgtacttctt caccgccgcc gtgcacgacg ccgtggacgc catccagccc 480  
 tccgcccgcg gcgagctgga gatcacgag gccctccagt ggctcctcga caagggcctc 540  
 ggcacgcgt cctccacggc caacggctac tggaaggaca ccggcaacgc caccgacatg 600  
 ctggaggatca accgcacggc gctcgacagg ctgaccccgt actgcgacgg ctccgctcgac 660  
 ggcgagagcg aactggtcgg ccgggtcgtc gtcgaggacg gcgcggtgat caccgctcc 720  
 cggatcgtgg gccccgccat catcgccgc gccacccgcg tcgagggtc ctacatcggc 780  
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 gtgctggccg gcgcggccat cgacggcgtc ggccggatcg aggcgtccat gatcgccgt 900  
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<210> 51  
 <211> 328  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 51

Met Asn Ile Leu Ile Thr Gly Ala Ala Gly Phe Ile Gly Ser His Leu  
 1 5 10 15

Val Arg Thr Ile Leu Gly Pro Asp Lys Pro Leu Gly Asp Asp Val Arg  
 20 25 30



Val Thr Val Leu Asp Ala Leu Thr Tyr Ala Gly Asn Arg Ala Ser Leu  
35 40 45  
Ala Ala Val Glu Asp Glu Pro Gly Phe Thr Phe Val His Gly Asp Ile  
50 55 60  
Thr Asp Ala Leu Leu Val Asp Arg Leu Val Ala Ala His Asp Ala Val  
65 70 75 80  
Val His Leu Ala Ala Glu Ser His Val Asp Arg Ser Ile Trp Arg Ala  
85 90 95  
Asp Ala Phe Val Arg Thr Asn Val Leu Gly Thr His Thr Leu Leu Glu  
100 105 110  
Ala Ala Leu Arg His Gly Thr Gly Pro Phe Val His Val Ser Thr Asp  
115 120 125  
Glu Val Tyr Gly Ser Val Pro Val Gly Ser Ser Val Glu Ser Asp Pro  
130 135 140  
Leu Thr Pro Ser Ser Pro Tyr Ser Ala Ser Lys Ala Ser Ser Asp Leu  
145 150 155 160  
Leu Ala Leu Ala Tyr His His Thr His Gly Leu Asp Val Arg Val Thr  
165 170 175  
Arg Cys Ser Asn Asn Tyr Gly Pro Tyr Gln His Pro Glu Lys Val Ile  
180 185 190  
Pro Leu Phe Val Thr Arg Leu Leu Ser Gly Ala Ala Val Pro Leu Tyr  
195 200 205  
Gly Asp Gly Gly Asn Val Arg Asp Trp Leu His Val Asp Asp His Cys  
210 215 220  
Arg Ala Leu Leu Ala Val Leu Thr Asp Gly Arg Ala Gly His Thr Tyr  
225 230 235 240  
Asn Ile Gly Gly Gly Thr Glu Leu Thr Asn Lys Glu Leu Thr Gly Leu  
245 250 255  
Leu Leu Asp Ala Cys Gly Ala Gly Trp Asp Arg Val Glu His Val Thr  
260 265 270  
Asp Arg Lys Gly His Asp Arg Arg Tyr Ser Val Asp Trp Thr Lys Ile  
275 280 285  
Arg Thr Glu Leu Gly Tyr Thr Pro Ala His Asp Phe Ala Glu Gly Leu  
290 295 300  
Ala Glu Thr Val Ala Trp Tyr Arg Thr Asn Arg Pro Phe Trp Ala Ala  
305 310 315 320  
Pro Gly Ala Glu Leu Gln Gly Ala  
325

<210> 52  
<211> 987  
<212> DNA

<213> Streptomyces aizunensis

<400> 52

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tacgcggggca accgcgcctc cctcgccgcc gtcgaggacg aaccggggctt caccttcgtg    180
cacggcgaca tcaccgacgc gctgctgggtg gaccgcctgg tggcgggcca cgacgccgtg    240
gtgcacctgg ccgccgagtc gcacgtcgac cgttcgatct ggcgggccga cgcgttcgta    300
cgcaccaatg tgctcggcac ccacaccctg ctggaggccg cgctgcggca cggcaccggc    360
ccgttcgtgc acgtgtcgac cgacgaggtg tacggctcgg tcccggtcgg ctcgtccgtc    420
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aactacgggc cctaccagca cccggagaag gtgatcccgc tcttcgtcac ccggctgctc    600
agtggcgccg ccgtcccgt ctacggcgac ggcgggaacg tacgcgactg gctgcacgtc    660
gacgaccact gccgcgtct gctggccgtc ctcaccgacg ggcgcgcggg gcacacgtac    720
aacatcggcg gcggcaccga gtcaccaac aaggagctga ccggcctgct gctggacgcc    780
tgcgggcgccg gatgggaccg ggtcgagcac gtcaccgacc gcaagggcca cgaccgccgg    840
tactccgtcg actggacgaa gatccgcacc gagctgggct acacccccgc gcacgacttc    900
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<210> 53

<211> 214

<212> PRT

<213> Streptomyces aizunensis

<400> 53

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20          25          30
Arg Met Ile Cys Phe Pro Ser Ser Arg Asn Ser Ser Ile Cys Tyr Leu
35          40          45
Ala Met Ser Glu Leu Leu Leu Pro Thr Val Glu Leu Leu Ile Val Gln
50          55          60
Tyr Pro Ala Leu Thr Ser Glu Glu Glu His Ser Ala Glu Glu Asp Ala
65          70          75          80
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Ala Leu Ala Asp Lys Ile Phe Glu Ala Val Arg Gly Trp Ala Asp Arg  
85 90 95

Pro Leu Ala Leu Phe Gly His Arg Leu Gly Ala Glu Leu Ala Tyr Ala  
100 105 110

Val Ala Gln Arg Leu Glu Arg Glu Thr Asp Ala Ala Pro Leu Thr Leu  
115 120 125

Phe Val Ser Gly Arg Thr Gly Pro Gly His Arg Gly Ser Leu Gly Pro  
130 135 140

Pro Ala Leu Asn Cys Arg Val Val Ala Leu Ala Gly Tyr His Asp Pro  
145 150 155 160

Arg Ala Pro Leu Ala Gly Val Arg Ala Trp Arg Arg Cys Thr Ala Gly  
165 170 175

Arg Phe Asp Leu Glu Val Phe Pro Gly Thr Arg Gly Tyr Leu Asp Ser  
180 185 190

His Arg Arg Glu Val Val Asn Leu Val His Asp Gln Leu Ile Ser Leu  
195 200 205

Arg Gly Pro Glu Pro Asp  
210

<210> 54  
<211> 645  
<212> DNA  
<213> Streptomyces aizunensis

<400> 54  
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cggaactcct cgatctgcta tctggccatg tcggaactgc tgctgccac cgtggaactg 180

ctcatcgctc agtaccggc cctgacctcc gaggaggagc attcggccga ggaggacgcg 240

gcgctcgccg acaagatctt cgaagcggtc cggggctggg ccgaccgcc gctcgccctc 300

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accgacgcg gacccctgac cctgttcgct tccggacgca cgggaccggg ccaccgcggc 420

agcctcgcc cgcccgcgct caactgccg gtcgtcgccc tggccgggta ccacgacccc 480

cgcgaccccc tggccggggg acgggcctgg cggcgctgca cggcgggacg gttcgacctg 540

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gtgcacgacc agctgatttc gctccgcgga ccggagcccc actga 645

<210> 55  
<211> 470  
<212> PRT  
<213> Streptomyces aizunensis

<400> 55

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Glu	Arg	Gly	Val	Cys	Leu	Gly	Asp	Arg	Val	Met	Leu	Lys	Ala	Gly	Asn	35	40	45	
Ser	Ala	Ser	Tyr	Val	Cys	Val	Leu	Tyr	Ala	Leu	Met	His	Ile	Gly	Ala	50	55	60	
Ser	Ile	Val	Leu	Val	Asp	Gln	Gln	Glu	His	Lys	Glu	Glu	Thr	Arg	Arg	65	70	75	80
Ile	Ala	Leu	Arg	Thr	Gly	Val	Lys	Val	Thr	Phe	Val	Asp	Asp	Glu	Thr	85	90	95	
Pro	Ile	Asp	Gln	Asp	Ala	Asp	Pro	Ile	His	Leu	Tyr	Glu	Leu	Met	Val	100	105	110	
Ala	Thr	Gln	Asn	Arg	Pro	Pro	Met	Asp	Ser	Ala	Leu	Ser	Phe	Asp	Ala	115	120	125	
Trp	Gly	Glu	Leu	Ser	Asp	Gly	Leu	Ile	Met	Trp	Thr	Ser	Gly	Ser	Thr	130	135	140	
Gly	Ser	Pro	Lys	Gly	Val	Val	Lys	Ser	Gly	Gly	Lys	Phe	Leu	Ala	Asn	145	150	155	160
Leu	Arg	Arg	Asn	Ala	His	Gln	Val	Gly	His	Arg	Pro	Asp	Asp	Val	Leu	165	170	175	
Met	Pro	Leu	Leu	Pro	Phe	Ala	His	Gln	Tyr	Gly	Leu	Ser	Met	Val	Leu	180	185	190	
Ile	Ala	Trp	Leu	Thr	Arg	Cys	Ser	Leu	Val	Ile	Ala	Pro	Tyr	Arg	Arg	195	200	205	
Leu	Asp	Arg	Ala	Leu	Arg	Met	Ala	Arg	Asp	Ser	Gly	Thr	Thr	Val	Ile	210	215	220	
Asp	Ala	Thr	Pro	Ser	Ser	Tyr	Arg	Ser	Ile	Leu	Gly	Leu	Val	Thr	Arg	225	230	235	240
Lys	Pro	Ala	Leu	Arg	Ala	His	Leu	Ala	Gly	Thr	Arg	Met	Phe	Cys	Val	245	250	255	
Gly	Ala	Ala	Pro	Leu	Asp	Ala	Pro	Leu	Val	Glu	Ser	Tyr	Val	Gln	Glu	260	265	270	
Phe	Gly	Leu	Pro	Leu	Leu	Asp	Ser	Tyr	Gly	Ser	Thr	Glu	Leu	Asn	Asn	275	280	285	
Ile	Ala	Phe	Ala	Thr	Leu	Asp	Asn	Pro	Val	Ser	Cys	Gly	Arg	Ala	Met	290	295	300	

Glu Gly Ile Gly Leu Arg Ile Val Asp Glu Asp Gly Arg Glu Val Ala  
 305 310 315 320  
 Ala Gly Gln Pro Gly Glu Ile Glu Val Asp Thr Pro Asp Ala Leu Glu  
 325 330 335  
 Gly Gln Ile Ala Glu Asp Gly Ser Ile Ile Pro Ala Pro Thr Gly Trp  
 340 345 350  
 Gln Arg Thr Gly Asp Leu Gly His Leu Asp Ala Asp Gly Asn Leu Tyr  
 355 360 365  
 Val Leu Gly Arg Lys Phe Ala Val His Arg Met Gly Tyr Thr Leu Tyr  
 370 375 380  
 Pro Glu Leu Ile Glu Arg Lys Val Ala Ala Glu Gly Cys Pro Thr Arg  
 385 390 395 400  
 Ile Val Pro Leu Pro Asp Glu Leu Arg Gly Ser Gln Leu Val Phe Phe  
 405 410 415  
 Val Glu Asp Asp Glu Gln Arg Asp Ala Gly Tyr Trp Arg Glu Arg Leu  
 420 425 430  
 Cys Gly Leu Leu Pro Ala Phe Glu Gln Pro Asn Lys Val Val Val Leu  
 435 440 445  
 Glu Gln Phe Pro Leu Asn Arg Asn Gly Lys Pro Asp Lys Lys Glu Leu  
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 Thr Arg Met Ala Ala Glu  
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<210> 56

<211> 1413

<212> DNA

<213> *Streptomyces aizunensis*

<400> 56

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cgggtcatgc tgaaggccgg caactcggcg agctacgtct gtgtgctgta cgcgctgatg	180
cacatcggcg cctcgatcgt cctcgtcgac cagcaggaac acaaggagga gacccgccgc	240
atcgcgctgc gcaccggcgt caaggtcacc ttcgtcgacg acgagacccc gatcgaccag	300
gacgccgacc ccatccacct gtacgaactc atggtggcca cccagaaccg tccgcccattg	360
gacagcgccc tgtcgttcga cgcttggggc gagctgtccg acggcctcat catgtggacc	420
tcgggctcca ccggatcgcc caagggcgtg gtgaagtccg gcgggaagtt cctggccaac	480
ctccggcgca acgcccacca ggtcggccac cgtcccgcag acgtcctgat gccgctgctg	540
ccgttcgccc accagtacgg cctgtcgatg gtcctcatcg cctggctcac ccgctgctcc	600
ctggtgatcg cccctaccg gcgtctggac cgggcgctgc gcatggcccg cgactcgggc	660

accacggtca tcgacgcgac cccctccagc taccggagca tcctgggcct ggtgaccagg 720  
aagcccgccc tgcgcgcgca cctggcgggc acccggatgt tctgtgtcgg cgcgcccccg 780  
ctcgacgcac cgctggtgga gagctacgta caggagtctg gcctgccgct gctcgacagc 840  
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gccgggcagc cgggcgagat cgaggtcgac acccccgcag cactcgaagg gcagatagcc 1020  
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<210> 57  
<211> 553  
<212> PRT  
<213> Streptomyces aizunensis  
<400> 57

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35 40 45  
Met Ala Gly Met Thr Ala Ala Tyr Glu Leu Met Arg Leu Gly Leu Arg  
50 55 60  
Pro Val Val Tyr Glu Ala Glu Gln Leu Gly Gly Arg Met Arg Ser Val  
65 70 75 80  
Pro Phe Pro Gly Gln Pro Gly Leu Val Ala Glu Met Gly Ala Met Arg  
85 90 95  
Phe Pro Leu Ser Ala Arg Ser Leu Phe His Tyr Ile Asp Leu Leu Gly  
100 105 110  
Leu Arg Thr Ser Pro Phe Pro Asn Pro Leu Ala Ala Asn Thr Pro Ser  
115 120 125  
Thr Leu Ile Asp Leu Gly Gly Glu Arg His Thr Ala Arg Ser Ala Glu

130					135					140					
Gln	Leu	Pro	Asp	Val	Tyr	Gln	Glu	Val	Ala	Ser	Ala	Trp	Glu	Lys	Ala
145					150					155					160
Leu	Gln	Glu	Arg	Ala	Glu	Leu	Ala	Thr	Met	Arg	Asp	Ala	Ile	Gln	Arg
				165					170					175	
Arg	Asp	Val	Glu	Thr	Val	Lys	Gln	Ile	Trp	Asn	Arg	Leu	Val	Arg	Glu
			180					185					190		
Phe	Asp	Asp	Gln	Ser	Phe	Tyr	Gly	Phe	Leu	Ala	Thr	Ser	Ser	Ala	Phe
		195					200					205			
Pro	Ser	Phe	Arg	His	Arg	Glu	Ile	Phe	Gly	Gln	Val	Gly	Phe	Gly	Thr
	210					215					220				
Gly	Gly	Trp	Asp	Thr	Asp	Phe	Pro	Asn	Ser	Leu	Leu	Glu	Ile	Leu	Arg
225					230					235					240
Val	Val	Tyr	Thr	Glu	Ala	Asp	Asp	Asn	Gln	Val	Ala	Ile	Asp	Gly	Gly
				245					250					255	
Ser	Gln	Gln	Val	Pro	Arg	Gly	Leu	Trp	Glu	His	Arg	Pro	Arg	Gly	Cys
			260					265					270		
Ala	His	Trp	Pro	Ala	Gly	Thr	Ser	Leu	Ala	Ser	Leu	His	Gly	Gly	Thr
		275					280					285			
Ala	Arg	Pro	Arg	Val	Arg	Ala	Val	Ala	Arg	Asp	Gly	Asp	Gly	Phe	Leu
	290					295					300				
Val	Thr	Asp	Ala	Asp	Gly	His	Arg	Glu	Arg	Phe	Ala	Ser	Val	Val	Tyr
305					310					315					320
Thr	Pro	His	Val	Trp	Thr	Leu	Leu	Asn	Arg	Val	Ala	Cys	Asp	Pro	Ala
			325						330					335	
Leu	Leu	Thr	Gln	Pro	Leu	Trp	Thr	Ala	Val	Glu	Arg	Thr	His	Tyr	Met
			340					345					350		
Gly	Ala	Ser	Lys	Leu	Phe	Val	Leu	Ala	Asp	Arg	Pro	Phe	Trp	Asn	Asp
		355					360					365			
Thr	Asp	Pro	Arg	Thr	Gly	Arg	Pro	Val	Met	Ser	Met	Thr	Leu	Thr	Asp
	370					375					380				
Arg	Met	Pro	Arg	Gly	Val	Tyr	Leu	Phe	Asp	Asp	Gly	Pro	Asp	Arg	Pro
385					390					395					400
Gly	Val	Met	Cys	Leu	Ser	Tyr	Thr	Trp	Asn	Asp	Asp	Ser	Leu	Lys	Met
			405						410					415	
Ala	Thr	Leu	Ser	Ala	Asp	Glu	Arg	Leu	Asp	Val	Leu	Leu	Glu	Lys	Leu
			420					425					430		
Gly	Val	Ile	Tyr	Pro	Gly	Val	Asp	Ile	Arg	Ser	His	Val	Ile	Gly	Asp
		435					440					445			
Pro	Ile	Thr	Ile	Thr	Trp	Glu	Ser	Glu	Pro	His	Phe	Met	Gly	Ala	Phe

450		455		460
Lys Ser Asn Leu Pro Gly Gln Tyr Arg Tyr Gln Arg Arg Leu Phe Thr				
465		470		475
				480
Gln Phe Met Gln Arg Gly Leu Pro Arg Ala Gln Arg Gly Phe Phe Leu				
	485		490	495
Cys Gly Asp Asp Val Ser Trp Thr Ala Gly Phe Ala Glu Gly Ala Val				
	500		505	510
Thr Thr Ala Leu Asn Ala Val Trp Gly Val Leu Asp His Leu Gly Gly				
	515		520	525
Ala Thr Pro Pro Gly Asn Pro Gly Pro Gly Asp Leu Phe Asp Ala Leu				
	530		535	540
Ala Pro Leu Asp Leu Pro Tyr Asp Ser				
545		550		

<210> 58  
 <211> 1662  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 58  
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 ccggtggccg tggtcggcgg gggaatggcg ggaatgaccg ccgcgtacga actgatgcgg 180  
 ctgggcctgc gcccggtcgt atacgaggcg gagcaactgg gtggccggat gcggtcgggtg 240  
 cccttccccg ggcagcccgg cctcgtggcg gagatggggg cgatgcgctt cccgctctcc 300  
 gcgcgctcgc tgttccacta catcgacctg ctggggctgc gcaccagccc cttccccaac 360  
 ccgctggcgg cgaacacccc gagcaccctc atcgacctcg gcggcgaacg gcacaccgcg 420  
 cggctccgcg agcaactccc ggatgtgtac caggaggtgg cctcggcctg ggagaaggcc 480  
 ctgcaggagc gggccgagct ggccaccatg cgggacgcca tccagcgccg cgacgtcgag 540  
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 gacggcttcc tcgtaccga cgccgacgga caccgggagc ggttcgcctc ggtggtgtac 960  
 accccgcacg tgtggacct gctgaaccgg gtcgcgtgcg atccggcgct gctgacgcag 1020



ccgctgtgga ccgccgtgga gcgcacccac tacatggggg cctccaaact gttcgtcctg 1080  
 gccgaccggc ccttctggaa cgacaccgat ccgcggaccg gccgtccggg gatgagcatg 1140  
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 gtgtcctgga cggcgggctt cgcgaggggc gcggtcacga cggcgctgaa cgcggtgtgg 1560  
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 ttcgacgcgc tggctcccct cgacctcccc tacgacagct ga 1662

<210> 59  
 <211> 231  
 <212> PRT  
 <213> *Streptomyces aizunensis*

<400> 59

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Gly	Pro	Asp	Gly	Ser	Ala	Leu	Leu	Tyr	Pro	Glu	Glu	Ala	Ala	Leu	Val
			20					25					30		
Ala	Met	Thr	Thr	Asp	Leu	Arg	Arg	Glu	Glu	Phe	Ala	Thr	Val	Arg	Ala
			35				40					45			
Cys	Ala	Arg	Arg	Ala	Leu	Ala	Ala	Leu	Gly	Leu	Pro	Ser	Ala	Pro	Val
	50					55					60				
Leu	Pro	Gly	Val	Arg	Asn	Val	Pro	Gln	Trp	Pro	Asp	Gly	Val	Val	Gly
65					70				75					80	
Ser	Met	Thr	His	Cys	Ala	His	Tyr	Arg	Ala	Ala	Val	Leu	Ala	Arg	Asp
				85				90						95	
Thr	Asp	Leu	Ala	Met	Ile	Gly	Ile	Asp	Ala	Glu	Pro	Asp	Leu	Pro	Leu
			100					105					110		
Pro	Glu	Gly	Val	Leu	Glu	Ser	Ile	Ala	Leu	Pro	Arg	Glu	Leu	Ala	Trp
		115					120					125			
Ala	Arg	Ser	Gly	Gly	Tyr	Gly	Ser	Ser	Leu	Arg	Arg	Asp	Arg	Leu	Leu
	130					135					140				
Phe	Ser	Ala	Lys	Glu	Ala	Val	Tyr	Lys	Thr	Trp	Tyr	Pro	Leu	Leu	Gly
145					150					155				160	

Thr Glu Leu Asp Phe Asp Asp Ala Asp Ile Thr Phe Arg His Glu Val  
 165 170 175  
 Gly Pro Asn Gly Arg Pro Gln Gly Thr Phe Thr Ala Arg Ile Leu Arg  
 180 185 190  
 Pro Leu Pro Gly Pro Asp Gly Arg Pro Val Asp Arg Phe Thr Gly Arg  
 195 200 205  
 Trp Leu Ser Asp Arg Gly Ile Ile Val Thr Val Ile Thr Leu Pro Ala  
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 Tyr Arg Val Ala Thr Thr Arg  
 225 230

<210> 60  
 <211> 696  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 60  
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 cggccgcagg gcacgttcac ggcccgcatc ctgctgcccgc tgcccgggtcc cgacggggcg 600  
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 accctgcccc cctatcgctg ggcgaccacg cggtaa 696

<210> 61  
 <211> 306  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 61

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 20 25 30  
 Ile Thr Glu Ser Leu Arg Pro Ser His Glu Asp Asp Trp Leu Ile Val

35					40					45					
Ala	Gly	Asp	Val	Gly	Glu	Leu	Thr	Glu	Asp	Ile	Glu	Trp	Ala	Leu	Arg
50					55					60					
Leu	Leu	Ala	Gly	Arg	Phe	Ala	Lys	Val	Val	Trp	Ala	Pro	Gly	Asn	His
65				70						75				80	
Glu	Leu	Trp	Thr	Pro	Arg	Glu	Asp	Thr	Val	Gln	Leu	Arg	Gly	Glu	Glu
				85					90					95	
Arg	Tyr	Arg	Tyr	Leu	Val	Glu	Met	Cys	Arg	Gly	Leu	Gly	Val	Val	Thr
			100					105					110		
Pro	Glu	Asp	Pro	Trp	Pro	Val	Trp	Glu	Gly	Pro	Gly	Gly	Pro	Val	Ala
		115					120					125			
Val	Ala	Pro	Leu	Phe	Leu	Leu	Tyr	Asp	Tyr	Thr	Phe	Arg	Val	Ala	Gly
	130					135					140				
Thr	Ser	Thr	Lys	Glu	Glu	Ser	Leu	Ala	Arg	Ala	His	Glu	Ala	Gly	Val
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Val	Cys	Thr	Asp	Glu	Tyr	Leu	Leu	His	Pro	Asp	Pro	Tyr	Arg	Ser	Arg
			165						170					175	
Asp	Asp	Trp	Cys	Arg	Ala	Arg	Val	Ser	Ala	Thr	Arg	Arg	Arg	Leu	Val
			180					185					190		
Ala	His	Asp	Pro	Ser	Val	Pro	Leu	Val	Leu	Val	Asn	His	Phe	Pro	Leu
		195					200					205			
Val	Arg	Glu	Pro	Thr	Asp	Val	Leu	Trp	His	Pro	Glu	Phe	Ala	Gln	Trp
	210					215					220				
Cys	Gly	Thr	Val	Leu	Thr	Ala	Asp	Trp	His	Arg	Arg	Phe	Ser	Thr	Ala
225				230					235					240	
Ala	Val	Val	Tyr	Gly	His	Leu	His	Ile	Pro	Arg	Thr	Thr	Trp	Tyr	Asp
				245				250						255	
Gly	Val	Arg	Phe	Glu	Glu	Val	Ser	Ile	Gly	Tyr	Pro	Arg	Glu	Trp	Arg
			260					265					270		
Arg	Arg	Gly	His	Pro	Arg	Gly	Leu	Leu	Arg	Gln	Ile	Leu	Pro	Tyr	Thr
		275					280					285			
Pro	Glu	Pro	Glu	Pro	Glu	Thr	Pro	Ala	Arg	Thr	Glu	Pro	Gln	Glu	Thr
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Arg	Ala														
305															

<210> 62  
 <211> 921  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 62  
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<210> 63  
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 <212> PRT  
 <213> Streptomyces aizunensis

<400> 63

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 35 40 45  
 Ala Ser Gly Lys Thr Ala Leu Leu His Arg Val Leu Glu Leu Thr Ala  
 50 55 60  
 Gly Ala Gly Pro Arg Val Ile Thr Ala Val Thr Ser Pro Ala Glu Gln  
 65 70 75 80  
 Ser Met Pro Phe Gly Val Val Glu Gln Leu Val Arg Asp Ala Gln Ala  
 85 90 95  
 Val Ser Asp Arg Leu Pro Leu His Pro Ser Ala Gly Pro Asp Ala Ala  
 100 105 110

Leu	Asp	Ser	Thr	Pro	Arg	Pro	Glu	Ser	Glu	Pro	Val	Pro	Ala	Glu	Ile	115	120	125
Leu	Met	Ala	Phe	His	Leu	Gln	Leu	Ala	Glu	Val	Cys	Ala	Arg	Gly	Pro	130	135	140
Val	Leu	Ile	Val	Val	Asp	Asp	Val	Gln	Tyr	Ala	Asp	Pro	Gln	Ser	Leu	145	150	155
Tyr	Cys	Leu	Ala	His	Met	Leu	Leu	Arg	Ala	Ser	Ala	Ser	Gly	Ala	Val	165	170	175
Val	Ser	Leu	Leu	Val	Ser	Arg	Gly	Pro	Asp	Val	Gly	Gly	Thr	Pro	Pro	180	185	190
Val	Val	Leu	Glu	Glu	Leu	Leu	Tyr	Gln	Leu	Arg	Gly	Leu	His	Val	Arg	195	200	205
Leu	Gly	Pro	Leu	Ser	Val	Asp	Gly	Val	Gly	Arg	Leu	Leu	Ala	Ala	Arg	210	215	220
Asp	Pro	Glu	Ala	Gly	Ala	Arg	Lys	Pro	Ala	Ala	Pro	Ala	Ser	Trp	Ser	225	230	235
Thr	Pro	Leu	Ala	Ala	Ser	Val	His	Ala	Ala	Thr	Gly	Gly	Asn	Pro	Leu	245	250	255
Leu	Val	His	Gly	Leu	Ile	Glu	Asp	Arg	Leu	Ser	Arg	Gln	Arg	Leu	Leu	260	265	270
Ala	Ala	Gly	Pro	Gly	Ala	Gly	Pro	Ala	Ser	Ala	Glu	Ala	Gly	Asn	Gly	275	280	285
Thr	Gly	Asn	Glu	Thr	Glu	Asp	Ala	Leu	Ala	Gly	Thr	Pro	His	Ala	Gly	290	295	300
Asp	Gln	Phe	Leu	Gln	Ser	Ala	Leu	Ile	Cys	Val	His	Arg	Thr	Gly	Ser	305	310	315
Asp	Gly	Leu	Arg	Val	Ala	Gln	Gly	Ile	Ala	Leu	Leu	Gly	Gly	Ala	Gly	325	330	335
Ser	Thr	Ser	Leu	Leu	Ala	Arg	Leu	Val	Glu	Val	Glu	Glu	Trp	Thr	Val	340	345	350
Glu	Gln	Val	Val	Thr	Ala	Leu	Asn	Glu	Ala	Gly	Val	Leu	Glu	Lys	Ser	355	360	365
Val	Phe	Arg	His	Gly	Gly	Val	Gln	Thr	Ala	Val	Val	Glu	Ser	Leu	Thr	370	375	380
Asp	Glu	Ala	Ala	Thr	Arg	Leu	Arg	Gln	Arg	Ala	Ala	Val	Leu	Leu	Tyr	385	390	395
Glu	Asp	Gly	Ala	Ala	Pro	Leu	Thr	Ile	Ala	Ala	Gln	Leu	Leu	Ser	His	405	410	415
Glu	Met	Ser	Ala	Pro	Asp	Glu	Glu	Trp	Val	Pro	Arg	Val	Leu	Ser	Glu	420	425	430

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Cys	Leu	Arg	Met	Ala	Glu	Ser	Cys	Cys	Arg	Asp	Glu	Thr	Glu	Arg	Met		
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Ala	Trp	Pro	Gln	Gln	Leu	Arg	Pro	Leu	Leu	Gly	Ala	Val	Arg	Asp	Gly		
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Asn	Gly	Trp	Met	Asp	Asp	Ala	Ala	Ala	Ala	Ile	Arg	Gln	Val	Val	Asp		
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Val	Leu	His	Arg	Ser	Pro	Asp	Ala	Arg	Leu	Ala	Thr	Glu	Leu	Gly	Ala		
	530					535					540						
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545					550					555					560		
Gly	Asp	Val	Pro	Ala	Pro	Ala	Arg	Gly	Ala	Gly	Glu	Arg	Leu	Ser	Ala		
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Gln	Glu	Glu	Ile	Leu	Leu	Thr	Ser	Ala	Arg	Val	Leu	His	Gly	Val	Leu		
			580					585					590				
Arg	Gly	Gly	Asp	Gly	Ala	Arg	Asp	Thr	Asp	Pro	Asp	Thr	Asp	Ala	Glu		
		595					600					605					
Asp	Phe	Ala	Glu	Ser	Ala	Glu	Arg	Thr	Leu	Ala	Gly	Thr	Arg	Leu	Thr		
	610					615					620						
Glu	Glu	Thr	His	Leu	Gly	Leu	Arg	Ala	Cys	Leu	Leu	Thr	Leu	Phe	Tyr		
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Ala	Asp	Arg	Pro	Ala	Thr	Ala	Thr	Leu	Trp	Ala	Asp	Arg	Leu	Leu	Val		
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Glu	Ala	Ala	Asp	Arg	Lys	Ala	Pro	Gly	Trp	Thr	Ala	Val	Leu	Arg	Ala		
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Ile	Arg	Ala	His	Met	Ser	Leu	Arg	Arg	Gly	His	Leu	Val	Glu	Ala	Arg		
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Arg	Leu	Ala	Glu	Gln	Ala	Leu	Asp	Gln	Leu	Pro	Pro	His	Gly	Trp	Gly		
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Glu	Asp	Met	Leu	Thr	Thr	Arg	His	Gly	Leu	His	Tyr	Leu	Tyr	Ala	Arg		
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Gly Arg His Gln Leu Ala Thr Gly Arg His His Ala Ala Leu Thr Asp  
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 Phe Thr Ala Cys Gly Glu Leu Met Arg Arg Trp Gly Met Asp Arg Ser  
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 Thr Leu Val Pro Trp Arg Val Gly Val Ala Glu Ala Arg Leu Ala Leu  
 785 790 795 800  
 Gly Ser Arg Glu Glu Ala Glu Arg Phe Ala Arg Glu Gln Leu Ala Gly  
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 Asp Ala Gly Gln Arg Val Arg Gly His Ala Leu Arg Val Leu Ala Ala  
 820 825 830  
 Ala Arg Pro Leu Arg Glu Arg Pro Ala Leu Leu Ala Gln Ala Val Ala  
 835 840 845  
 Leu Leu Gln Glu Asp Ser Asp Trp Tyr Glu Leu Ala Arg Ala Leu Thr  
 850 855 860  
 Asp Leu Gly Gln Ala Tyr Lys Gln Leu Gly Asp Pro Ser Gln Gly Lys  
 865 870 875 880  
 Val His Thr Arg Arg Ala Trp Arg Ile Ala Lys Gly Cys Gly Ala Arg  
 885 890 895  
 Glu Leu Tyr Arg Ser Leu His Pro Ser Gln Pro Pro Ala Pro Ser Ala  
 900 905 910  
 Pro Ala Ala Gln Pro Arg Pro Ala Ala Pro Ala Asp Ala Ala Arg Pro  
 915 920 925  
 Pro Ser Ala Ala Val Ser Ser Leu Thr Asp Ala Glu Arg Lys Val Ala  
 930 935 940  
 Ala Leu Ala Ala His Gly Tyr Thr Asn Arg Glu Ile Gly Ala Lys Leu  
 945 950 955 960  
 Phe Ile Thr Val Ser Thr Val Glu Gln His Leu Thr Arg Val Tyr Arg  
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 Asp Val Ala His Thr Ala  
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<210> 64

<211> 2997

<212> DNA

<213> Streptomyces aizunensis

<400> 64

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atcgccgtga tcgacgggcc ggtggcttcg ggaaagacgg cgctcctcca tcgctgtctg 180

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<211> 518  
<212> PRT  
<213> Streptomyces aizunensis  
<400> 65

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Ala	Lys	Gly	Lys	Leu	Thr	Ala	Arg	Glu	Arg	Ile	Gly	Leu	Leu	Leu	Asp
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Glu	Gly	Ser	Phe	Arg	Glu	Val	Glu	Gln	Leu	Arg	Arg	His	Arg	Ala	Ser
	50					55					60				
Gly	Phe	Gly	Leu	Glu	Ala	Lys	Arg	Pro	Tyr	Thr	Asp	Gly	Val	Ile	Thr
65					70					75				80	
Gly	Trp	Gly	Thr	Ile	Glu	Gly	Arg	Thr	Val	Phe	Val	Tyr	Ala	His	Asp
				85					90					95	

Phe	Arg	Ile	Phe	Gly	Gly	Ala	Leu	Gly	Glu	Ala	His	Ala	Thr	Lys	Ile	100	105	110
His	Lys	Ile	Met	Asp	Met	Ala	Ile	Ala	Ala	Gly	Ala	Pro	Leu	Val	Ser	115	120	125
Leu	Asn	Asp	Gly	Ala	Gly	Ala	Arg	Ile	Gln	Glu	Gly	Val	Ser	Ala	Leu	130	135	140
Ala	Gly	Tyr	Gly	Gly	Ile	Phe	Gln	Arg	Asn	Thr	Lys	Ala	Ser	Gly	Val	145	150	155
Ile	Pro	Gln	Ile	Ser	Val	Met	Leu	Gly	Pro	Cys	Ala	Gly	Gly	Ala	Ala	165	170	175
Tyr	Ser	Pro	Ala	Leu	Thr	Asp	Phe	Val	Phe	Met	Val	Arg	Glu	Thr	Ser	180	185	190
Gln	Met	Phe	Ile	Thr	Gly	Pro	Asp	Val	Val	Lys	Ala	Val	Thr	Gly	Glu	195	200	205
Glu	Ile	Thr	Gln	Asn	Gly	Leu	Gly	Gly	Ala	Asp	Val	His	Ala	Gly	Thr	210	215	220
Ser	Gly	Val	Ala	His	Phe	Ala	Tyr	Asp	Asp	Glu	Glu	Thr	Cys	Ile	Ala	225	230	235
Glu	Val	Arg	Tyr	Leu	Leu	Ser	Met	Leu	Pro	Ser	Asn	Asn	Arg	Glu	Asn	245	250	255
Pro	Pro	Ala	Val	Gln	Ala	Gly	Asp	Pro	Ala	Asp	Arg	Arg	Cys	Asp	Ala	260	265	270
Leu	Leu	Asn	Leu	Val	Pro	Val	Asp	Gly	Asn	Arg	Pro	Tyr	Asp	Met	Leu	275	280	285
Lys	Val	Ile	Glu	Glu	Ile	Val	Asp	Asp	Gly	Asp	Tyr	Val	Glu	Ile	His	290	295	300
Glu	Gly	Trp	Ser	Arg	Asn	Ile	Ile	Cys	Ala	Leu	Ala	Arg	Leu	Asp	Gly	305	310	315
Gln	Val	Val	Ala	Ile	Val	Ala	Asn	Gln	Pro	Gln	Phe	Leu	Ala	Gly	Val	325	330	335
Leu	Asp	Ile	Gly	Ala	Ser	Glu	Lys	Ala	Ala	Arg	Phe	Val	Gln	Met	Cys	340	345	350
Asp	Ala	Phe	Asn	Ile	Pro	Ile	Val	Thr	Leu	Leu	Asp	Val	Pro	Gly	Phe	355	360	365
Leu	Pro	Gly	Val	Asp	Gln	Glu	His	Gly	Gly	Ile	Ile	Arg	His	Gly	Ala	370	375	380
Lys	Leu	Leu	Tyr	Ala	Tyr	Cys	Asn	Ala	Thr	Val	Pro	Arg	Ile	Ser	Leu	385	390	395
Ile	Leu	Arg	Lys	Ala	Tyr	Gly	Gly	Ala	Tyr	Ile	Val	Met	Asp	Ser	Gln	405	410	415

Ser Ile Gly Ala Asp Leu Thr Tyr Ala Trp Pro Thr Asn Glu Ile Ala  
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 Val Met Gly Ala Glu Gly Ala Ala Asn Val Ile Phe Arg Arg Gln Ile  
                   435                                  440                                  445  
 Ala Glu Ser Gly Asp Pro Glu Ala Met Arg Ala Arg Met Val Lys Glu  
                   450                                  455                                  460  
 Tyr Lys Ala Glu Leu Met His Pro Tyr Tyr Ala Ala Glu Arg Gly Leu  
                   465                                  470                                  475                                  480  
 Val Asp Asp Val Ile Asp Pro Ala Glu Thr Arg Glu Val Leu Ile Ala  
                                   485                                  490                                  495  
 Ser Leu Ala Met Leu Arg Thr Lys His Ala Asp Leu Pro Pro Arg Lys  
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<210> 66  
 <211> 1557  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 66  
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<210> 67  
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 <213> Streptomyces aizunensis

<400> 67

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 35 40 45  
 Pro Phe Asp Ser Gly Val Thr Tyr Arg Pro Gly Ala Arg Phe Gly Gly  
 50 55 60  
 Asn Ala Ile Arg Glu Ala Ser Arg Thr Leu Arg Pro Tyr Asn Pro Ala  
 65 70 75 80  
 Gln Asn Val Tyr Pro Phe His Phe Ser Gln Val Ala Asp Ala Gly Asp  
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 Ile Ser Ala Asn Pro Phe Asp Leu Asn Asp Ala Val Glu Thr Ile Glu  
 100 105 110  
 Ala Ala Ala Asp Asp Leu Ile Ser Ser Gly Ala Arg Leu Met Thr Leu  
 115 120 125  
 Gly Gly Asp His Thr Ile Ala Leu Pro Met Leu Arg Ala Val Ala Lys  
 130 135 140  
 Lys His Gly Pro Leu Ala Val Leu His Phe Asp Ala His Leu Asp Thr  
 145 150 155 160  
 Trp Asp Asp Tyr Phe Gly Gln Gln Tyr Thr His Gly Met Pro Phe Arg  
 165 170 175

Arg Ala Val Glu Glu Gly Ile Leu Asp Thr Ser Ala Leu Ser His Val  
 180 185 190  
 Gly Thr Arg Gly Pro Ile Tyr Gly Lys Lys Asp Leu Asp Asp Asp Glu  
 195 200 205  
 Lys Leu Gly Phe Gly Ile Val Thr Ser Ala Asp Val Met Arg Arg Gly  
 210 215 220  
 Val Asp Glu Val Ala Gln Gln Leu Arg Glu Arg Val Gly Asp Arg Pro  
 225 230 235 240  
 Leu Tyr Ile Ser Ile Asp Ile Asp Val Leu Asp Pro Ala His Ala Pro  
 245 250 255  
 Gly Thr Gly Thr Pro Glu Ala Gly Gly Leu Thr Ser Arg Glu Leu Leu  
 260 265 270  
 Glu Ile Leu Arg Gly Leu Ala Asp Cys His Leu Val Ser Ala Asp Ile  
 275 280 285  
 Val Glu Val Ala Pro Ala Tyr Asp His Ala Asp Ile Thr Ser Val Ala  
 290 295 300  
 Ala Ser His Ala Ala Tyr Glu Leu Ile Ser Ile Met Ser Lys Gln Ile  
 305 310 315 320  
 Ala Pro Val Arg Trp Gly Ala Thr Gln  
 325

<210> 68

<211> 990

<212> DNA

<213> *Streptomyces aizunensis*

<400> 68

atgaccgcgc accccaacgg agtgaccccc cgcgtgccgc cgacggagac cgaccggacg	60
ctgcacttcg cgggccccgc gacgttcggc cgcattcccc ggatcgacca ggtggagaag	120
accgacatcg ccgtggtcgg cgtgcctttc gacagcggcg tcacctatcg gccgggcgcc	180
cgcttcggcg gcaacgccat ccgggaggcg tccgcaccc tgcgtcccta caaccggcg	240
cagaacgtct accccttcca cttcagtcag gtcgcggacg ccggtgacat cagcgccaac	300
cccttcgacc tgaacgacgc cgtggagacg atcgaggcgg ccgccgacga cctgatctcc	360
agcggcgccc gtctgatgac gctggggcgc gaccacacca tcgccctgcc gatgctgcgt	420
gccgtggcga agaagcacgg tcccctcgcc gtcctgcact tcgacgcca tctggacacc	480
tgggacgact acttcgggca gcagtacacc cacggcatgc cgttcgcgg cgccgtggag	540
gagggcatcc tcgacacctc cgccctctcc cacgtcggca cgcgcggccc gatctacggc	600
aagaaggatc tcgacgacga cgagaagctc ggcttcggca tcgtcacctc ggccgatgtg	660
atgcggcgcg gaggggacga ggtggcccag cagttgcgcg agcgcgtcgg cgaccgtccc	720

ctgtacatct ccacgacat cgacgtcctg gacccggcgc acgccccggg caccggcacc	780
cccgaggccg gcggcctcac ctcccgcgag ctgctggaga tcctgcgcgg gctcggcgac	840
tgccacctgg tctccgcgga catcgtggag gtcgctccgg cctacgacca cgccgacatc	900
acctcggtgg cggcgtccca cgctgcctac gagctgatca gcatcatgtc caagcagata	960
gccccggtcc gctgggggtgc gacgcagtaa	990

<210> 69  
 <211> 521  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 69

Val Thr Pro Gln Asp His Trp Trp Ser Ala Ser Gln Ser Tyr Val Ser	1 5 10 15
Asp Ile Leu Ser Val Phe Ala Ala Ala Pro Asp Arg Pro Ala Val Asn	20 25 30
Trp Arg Gly Glu Thr Ala Ser Gly Gly Glu Leu Ile Arg Ser Val Thr	35 40 45
Glu Ala Phe His Ala Leu His Asp Ser Gly Val Arg Ala Gly Asp Val	50 55 60
Val Ala Ile Leu Val Ala Pro Asn Ser Pro Glu Met Leu Thr Ala Arg	65 70 75 80
Tyr Ala Ala His Leu Leu Gly Gly Ala Val Cys Tyr Leu Arg Ser Thr	85 90 95
Asn Pro Gly Thr Ser Glu Val Ala Leu Pro Leu Asp Gln Gln Ile Arg	100 105 110
Ile Leu Arg Asp Thr Glu Ala Val Thr Val Tyr Thr Asp Ala Glu Asn	115 120 125
Ala Pro Arg Ala Ala Glu Leu Ala Ala Gly Ala Ser Gly Leu Pro Val	130 135 140
Thr Cys Leu Thr Gly Glu Ala Arg Lys Arg Glu Ser Ala Glu Asp Ala	145 150 155 160
Pro Arg Ala Leu Pro Trp Ala Pro Asp Ala Leu Ala Leu Ile Thr Phe	165 170 175
Thr Ser Gly Ser Thr Gly Arg Pro Lys Gly Ile Arg Leu Ala Gly Arg	180 185 190
Ala Trp Asn Gly Leu Val Gln Gly Met Val Ala Ala Gly Gly Glu Ala	195 200 205
Glu Gly Val Lys Leu Leu Val Thr Thr Pro Leu Ser His Thr Val Gly	210 215 220

Ser Met Ala Asp Thr Ala Leu Ala Leu Gly Gly Glu Val Tyr Leu His  
 225 230 235 240  
 Glu Asn Phe Asn Ala Glu Gln Phe Val Asn Thr Val Ala Asp Glu Gly  
 245 250 255  
 Ile Ala Trp Thr Phe Met Ala Thr Val His Leu Phe Gln Leu Leu Asp  
 260 265 270  
 His Leu Glu Glu Arg Gly Leu Lys Asp Val Glu Glu Gly Arg Leu Ala  
 275 280 285  
 Pro Leu Gln Arg Leu Ile Tyr Ser Gly Ser Ala Ala Ala Pro Ala Arg  
 290 295 300  
 Ile Ala Gln Ala Val Lys Ala Phe Gly Leu Ile Ile Val Gln Ala Tyr  
 305 310 315 320  
 Gly Thr Gly Glu Thr Gly Arg Leu Thr Thr Leu Phe Pro His Glu His  
 325 330 335  
 Leu Asp Pro Trp Leu Ser Thr Thr Val Gly Arg Pro Phe Pro Asp Val  
 340 345 350  
 Glu Val Val Val Gly Asp Gln Glu Ser Gly Ala Pro Leu Ala Thr Gly  
 355 360 365  
 Glu Val Gly Glu Val Arg Val Arg Ser Pro His Met Met Asp Gly Tyr  
 370 375 380  
 Thr Gly Asp Pro Ala Ala Thr Ala Lys Val Leu Arg Asp Gly Trp Tyr  
 385 390 395 400  
 His Thr Gly Asp Ile Gly Tyr Thr Asp Glu His Gly Tyr Leu His Leu  
 405 410 415  
 Leu Gly Arg Val Ala Asp Val Val Lys Val Asn Gly Val Lys Val His  
 420 425 430  
 Pro Thr Val Val Glu Arg Glu Leu Leu Ser Leu Ala Gly Val Arg His  
 435 440 445  
 Ala Ala Val Tyr Gly Val Arg Asp Gln Asp Ala Val Glu His Leu His  
 450 455 460  
 Ala Thr Ile Val Cys Asp Pro Ala Val Pro Val Glu Thr Asp Ala Ile  
 465 470 475 480  
 Arg Ala His Leu Ala Gln Ser Leu Ser Gly Leu His Val Pro Glu Lys  
 485 490 495  
 Ile Ser Val Val Ala Asp Leu Pro Leu Asn Asp Asn Gly Lys Pro Asp  
 500 505 510  
 Lys Val Arg Leu Gln Leu Leu Asp Ser  
 515 520

<210> 70  
 <211> 1566  
 <212> DNA

<213> Streptomyces aizunensis

<400> 70

gtgaccccg	aggaccattg	gtggagcgca	agccagagtt	acgtctcgga	catcctctcc	60
gttttcgcgg	cggccccgga	ccgccccgcg	gtgaattggc	ggggcgagac	ggcctccggc	120
ggtgaattga	ttcggtcggt	gaccgaggcg	ttccacgcac	tgcacgacag	cggcgtgcgc	180
gcgggcgatg	tcgtggccat	cctggtggcg	cccaacagcc	cggagatgct	cacggcacgg	240
tacgcggcgc	acctgctcgg	cggcgcggtg	tgctacctgc	ggccaccaaa	ccccggaacc	300
agcgagggtg	cccttcgcgt	ggaccagcag	atccggatcc	tgccggacac	cgaggccgtg	360
accgtctaca	cggacgccga	gaacgcgccc	cgcgccgccc	aactggccgc	gggcgccagt	420
ggactgcccc	tgacgtgcct	gacgggtgag	gcgcgcaaga	gggagagcgc	ggaagacgct	480
ccgcgcgccc	tgccgtgggc	cccggatgca	ctggccctca	tcacgttcac	cagcggcagc	540
accggacggc	cgaagggcat	ccggctggcg	ggccggggcg	ggaacggcct	ggtccagggc	600
atggtggcgg	ccggcggcga	agccgagggc	gtcaagctcc	tggtcaccac	cccgttgagc	660
cacaccgtcg	gcagcatggc	ggacaccgcg	ctggcgctgg	gcggcgaggt	ctacctgcac	720
gagaacttca	acgccgaaca	gttcgtcaac	accgtggccg	acgagggcat	cgcgtggacc	780
ttcatggcga	cgggccatct	gttcagctg	ctcgaccacc	tggaggagcg	cggcctgaag	840
gacgtcgagg	aaggacgcct	ggccccgctg	cagcggctca	tctacagcgg	cagcgcggcg	900
gcgcccccca	ggatcgccca	ggccgtgaag	gccttcggtc	tcacatcgt	gcaggcgtag	960
ggcacgggag	agaccggccg	gctcaccacc	ctcttcccgc	acgagcacct	ggaccctgtg	1020
ctctcgacca	ccgtcggggc	gcccttcccc	gatgtggagg	tcgtcgtcgg	cgaccaggag	1080
tcgggcgcgc	cgctcgccac	cggcgaggtc	ggcgaagtcc	gcgtgcgctc	cccgcacatg	1140
atggacggct	acaccgggga	cccggcgggc	accgcgaagg	tcctgcgcga	cggctggtac	1200
cacaccggcg	acatcggtta	caccgacgaa	cacggctatc	tgcacctgct	gggccgggtc	1260
gccgacgtgg	tcaagggtcaa	cggcgtcaag	gtccacccca	cgggtggtcga	acgggagctc	1320
ctctcgtcgc	cgggcgtccg	gcacgcgcgc	gtgtacggcg	tgccgggacca	ggacgccgtg	1380
gagcacctgc	acgccacgat	cgtgtgcgac	ccggcggtgc	cgggtggagac	cgacgccatt	1440
cgcgcgaccc	tcgcccagtc	cctctccggg	ctgcacgtgc	ccgaaaagat	cagcgtcgtc	1500
gccgatctgc	cgctgaatga	caacggaaaag	cccgacaagg	tgccggctgca	gctgctcgac	1560
tcctga						1566

<210> 71

<211> 410



<212> PRT  
 <213> Streptomyces aizunensis

<400> 71

Met	Asn	Leu	His	Leu	Glu	Ser	Tyr	Ser	Thr	Gly	Val	Thr	Ala	Lys	Glu	1	5	10	15
Leu	Ala	Glu	Arg	Arg	Arg	Glu	Phe	Leu	Glu	Ile	Gly	Arg	Arg	Ser	Gly	20	25	30	
His	Phe	Pro	Ser	Ala	Ser	Ala	Arg	Gln	Asp	Gly	Val	Asp	Ser	Gln	Ile	35	40	45	
Ser	Val	Trp	Cys	Ser	Asn	Asp	Tyr	Leu	Gly	Met	Gly	Gln	Asn	Pro	Gln	50	55	60	
Val	Ile	Glu	Ala	Met	Lys	Lys	Thr	Ile	Asp	Thr	His	Gly	Val	Gly	Ser	65	70	75	80
Gly	Gly	Ser	Arg	Asn	Ile	Gly	Gly	Thr	Asn	His	Tyr	His	Val	Leu	Leu	85	90	95	
Glu	Ala	Glu	Leu	Ala	Asp	Leu	His	Gly	Lys	Glu	Ala	Ala	Leu	Leu	Phe	100	105	110	
Thr	Ser	Gly	Tyr	Thr	Ala	Asn	Asp	Gly	Ser	Leu	Ser	Val	Leu	Ala	Gly	115	120	125	
Thr	Pro	Lys	Asp	Thr	Ile	Val	Phe	Ser	Asp	Glu	Lys	Asn	His	Ala	Ser	130	135	140	
Ile	Ile	Asp	Gly	Leu	Arg	His	Ser	Gly	Ala	Gln	Lys	His	Ile	Phe	Arg	145	150	155	160
His	Asn	Asp	Val	Ala	His	Leu	Ala	Glu	Leu	Leu	Ala	Ala	Ala	Pro	Ala	165	170	175	
Asp	Arg	Pro	Lys	Leu	Ile	Val	Leu	Glu	Ser	Val	Tyr	Ser	Met	Ser	Gly	180	185	190	
Asp	Ile	Ala	Pro	Leu	Ala	Glu	Ile	Ala	Glu	Leu	Ala	Arg	Arg	Tyr	Asp	195	200	205	
Ala	Thr	Thr	Tyr	Ile	Asp	Glu	Val	His	Ala	Val	Gly	Met	Tyr	Gly	Pro	210	215	220	
Gln	Gly	Ala	Gly	Ile	Ala	Ala	Arg	Glu	Gly	Ile	Ala	Asp	Gln	Phe	Thr	225	230	235	240
Val	Val	Met	Gly	Thr	Leu	Ala	Lys	Gly	Tyr	Gly	Thr	Val	Gly	Gly	Tyr	245	250	255	
Ile	Ala	Gly	Pro	Ala	Ala	Leu	Val	Asp	Ala	Val	Arg	Thr	Leu	Ser	Arg	260	265	270	
Ala	Phe	Val	Phe	Thr	Thr	Ser	Leu	Pro	Pro	Ala	Val	Ala	Ala	Gly	Ala	275	280	285	
Leu	Glu	Ala	Val	Arg	Tyr	Leu	Arg	Asn	Ser	Asp	Val	Glu	Arg	Lys	Val				

290	295	300
Leu Ala Glu Asn Ala Gln Leu Leu His Arg Leu Leu Asp Glu Ala Asp		
305	310	315 320
Ile Pro Phe Ile Ser Pro Asp Ser His Ile Val Ser Ala Phe Ile Gly		
	325	330 335
Asp Asp Glu Thr Cys Lys Gln Ala Ser Arg Leu Leu Phe Glu Arg His		
	340	345 350
Gly Ile Tyr Val Gln Ser Ile Asn Ala Pro Ser Val Pro Leu Gly Gln		
	355	360 365
Glu Ile Leu Arg Ile Ala Pro Ser Thr Val His Gly Arg Glu Asp Val		
	370	375 380
Glu Asn Phe Ala Glu Ala Leu Arg Gly Ile Trp Lys Glu Leu Asn Ile		
385	390	395 400
Pro Thr Ala Thr Asp Arg Asn Trp Leu Ser		
	405	410

<210> 72  
 <211> 1233  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 72  
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 caggacggcg tggactccca gatcagcgtc tgggtgcagca acgactacct cggtatgggg 180  
 cagaaccccc aggtcatcga ggcgatgaag aagaccatcg acaccacgg cgtgggctcc 240  
 ggcggctcgc ggaacatcgg tggcaccaac cactaccacg tgctgctcga agcggagctg 300  
 gcggacctcc acggcaagga ggcggcgctc ctcttcacct ccggctacac ggccaacgac 360  
 ggttccttga gcgtcctggc cgggacgccc aaggacacga tcgtcttctc cgacgagaag 420  
 aaccacgcgt cgatcatcga cgggctgcgg cacagcggcg cgcagaagca catcttccgg 480  
 cacaacgacg tcgcgcacct ggcggagctg ctgcgcggcg cccccgccga ccgtccgaag 540  
 ctgatcgtcc ttgagtcggt ctattcgatg tcgggcgaca tcgcgcgct ggccgagatc 600  
 gccgagctcg cgcgccgcta cgacgccacc acgtacatcg acgaggtgca cgcggctcggc 660  
 atgtacggtc cgcagggcgc cggcatcgcc gcccgtaggg gcatagccga ccagttcacc 720  
 gtcgtgatgg gcacgctggc caagggctac ggcaccgtcg gcggctacat tgccgggtccc 780  
 gccgccctcg tcgacgccgt gcgcaccctg tcgcgcgcct tcgtcttcac cacctcgtg 840  
 ccgccggccg tcgcggcggg tgcgctggag gccgtgcgct acctccggaa ctccgacgtc 900  
 gagcgggaagg tgctggcgga gaacgcccag ctgctgcacc ggctgctcga tgaggccgac 960

atcccgttca tctcgccgga ctgcacatc gtctccgcct tcatcgggga cgacgagacc 1020  
 tgcaagcagg cgtcccggct gctcttcgag cggcacggga tctacgtcca gtccatcaac 1080  
 gccccagcg tgccgctcgg ccaggagatc ctgcggatcg cgccgtccac ggtgcacggg 1140  
 cgcgaggacg tcgagaactt cgccgaggcc ctccgcggga tctggaaaga gctgaacatc 1200  
 ccgacggcca ccgacaggaa ctggctttcg tga 1233

<210> 73  
 <211> 506  
 <212> PRT  
 <213> Streptomyces aizunensis

<400> 73

Val	Thr	Arg	Ser	Val	Ala	Ala	Val	Leu	Ala	Glu	Ser	Ala	Gly	Arg	Trp
1				5				10						15	
Pro	Ser	Arg	Thr	Ala	Leu	Val	Cys	Gly	Ala	Glu	Arg	Ile	Ser	Tyr	Ala
			20					25					30		
Arg	Leu	Trp	Asp	Arg	Ala	Arg	Arg	Tyr	Ala	Ala	Ala	Leu	Arg	Gly	Gln
		35					40					45			
Gly	Ile	Gly	Pro	Asp	Asp	Lys	Val	Ala	Leu	Leu	Met	Pro	Asn	Thr	Pro
	50					55					60				
Glu	Phe	Ala	Ala	Val	Tyr	Phe	Ala	Val	Leu	Ala	Leu	Gly	Ala	Val	Val
65				70					75						80
Val	Pro	Val	His	Thr	Leu	Leu	Lys	Pro	Ala	Glu	Val	Ser	His	Leu	Leu
			85					90						95	
Arg	Asp	Ser	Gly	Ala	Arg	Ala	Leu	Val	Trp	Ala	Gly	Thr	Leu	Pro	Gln
			100					105					110		
Glu	Thr	Ala	Arg	Asp	Ala	Gly	Glu	Thr	Gly	Val	Leu	Leu	Leu	Thr	Val
		115					120					125			
Gly	Glu	Ala	Leu	His	Gly	Ser	Val	Leu	Leu	Asp	Asp	Gly	Val	Glu	Pro
	130					135					140				
Ile	Asp	Thr	Tyr	Val	Glu	Arg	Gly	Ala	Asp	Asp	Leu	Ala	Leu	Val	Leu
145				150					155						160
Tyr	Thr	Ser	Gly	Thr	Thr	Gly	Arg	Pro	Lys	Gly	Ala	Met	Leu	Thr	His
			165					170						175	
Gly	Asn	Val	Ala	Thr	Asn	Ile	Ala	Val	Thr	Ala	Val	Ser	Pro	Phe	Ala
		180					185						190		
Phe	Gly	Glu	Asp	Asp	Val	Leu	Leu	Gly	Ala	Leu	Pro	Leu	Ser	His	Thr
		195					200					205			
Phe	Gly	Gln	Ile	Cys	Gly	Met	Ala	Val	Thr	Phe	His	Ala	Gly	Ala	Thr
	210					215					220				

Leu Val Val Met Glu Arg Phe Glu Ala His Asp Ala Leu Arg Leu Met  
 225 230 235 240  
 Arg Glu His Gly Cys Thr Val Phe Met Gly Val Pro Thr Met Tyr His  
 245 250 255  
 Ala Leu Leu Glu Ala Val Ala Ala Gly Ala Pro Ala Pro Arg Leu Thr  
 260 265 270  
 Arg Val Tyr Ser Gly Gly Ser Ala Leu Pro Val Pro Val Leu Asp Arg  
 275 280 285  
 Val Arg Ala Ala Phe Gly Cys Glu Val Tyr Glu Gly Tyr Gly Leu Thr  
 290 295 300  
 Glu Thr Ser Pro Cys Val Ala Tyr Asn Gln Pro Gly Ile Pro Cys Lys  
 305 310 315 320  
 Pro Gly Thr Val Gly Leu Pro Ile Asp Gly Val Arg Val Ala Ile Ala  
 325 330 335  
 Asp Ala Glu Leu Glu Gly Arg Ile Arg Leu Leu Lys Gln Gly Asp Ile  
 340 345 350  
 Gly Glu Ile Val Val Ser Gly His Asn Val Met Ala Gly Tyr Leu Gly  
 355 360 365  
 Arg Pro Gln Glu Thr Ala Glu Val Leu Val Asp Gly Trp Phe Arg Thr  
 370 375 380  
 Gly Asp Met Gly Val Gln Asp Glu Asp Gly Tyr Leu Ser Ile Val Asp  
 385 390 395 400  
 Arg Lys Lys Asp Met Ile Val Arg Gly Gly Tyr Asn Val Tyr Pro Arg  
 405 410 415  
 Glu Val Glu Asp Val Leu Leu Arg His Pro Ala Val Asp Gly Ala Cys  
 420 425 430  
 Val Val Gly Val Pro Ser Val Lys His Gly Glu Glu Val Cys Ala Val  
 435 440 445  
 Val Arg Val Lys Pro Gly Gln Arg Ala Ser Gly Leu Leu Ala Glu Glu  
 450 455 460  
 Ile Val Ala Trp Ser Arg Val His Met Ala Ala Tyr Lys Tyr Pro Arg  
 465 470 475 480  
 Arg Val Glu Phe Val Glu Thr Phe Pro Leu Gly Ser Ser Gly Lys Val  
 485 490 495  
 Leu Lys Arg Glu Leu Ala His Arg Tyr Ala  
 500 505

<210> 74  
 <211> 1521  
 <212> DNA  
 <213> Streptomyces aizunensis

<400> 74  
gtgacccggg cggtggcggc cgtcctcgca gagtccgcgg ggcggtggcc atccccgacc 60  
gccctggtgt gcggggcgga gcggatctcg tacgcgcgtc tgtgggaccg ggcccgcgga 120  
tacgccgccg ccctgcgcgg ccagggcatc ggccccgacg acaaggctcg gctgctgatg 180  
ccgaacaccc cggagttcgc ggcggtgtac ttcgcggtgc tcgcgctcgg cgccgtcgtc 240  
gtccccgttc acacctgct gaagcccgcg gaggtctcgc atctctctcg ggactcggga 300  
gcgcggggccc tcgtatgggc cgggacgctc ccgcaggaga ccgcacggga cgccggggag 360  
accgggggtcc tgctcctgac cgtgggggag gccctgcacg gctccgtcct cctcgacgac 420  
ggcgctcgagc ccatcgacac gtatgtcgag cggggggcgg acgacctcgc gctggtgctg 480  
tacacctccg gtacgacggg caggccgaag ggggcgatgc tcacgcacgg caacgtcgcg 540  
acgaacatcg ccgtgaccgc cgtgtccccc ttcgccttcg gcgaggacga cgtgctgctc 600  
ggcgcgctgc cgctgtcgca caccttcggc cagatctgcg ggatggccgt caccttcac 660  
gcgggcgcga cgctggtggt catggagcgc ttcgaggcgc acgacgccct gcggctgatg 720  
cgcgagcacg gctgcacggt cttcatgggc gtgccgacca tgtaccacgc gctgctcgaa 780  
gcggtcgcgg ccggcgcccc ggcgccgcgc ctacccgcg tgtacagcgg tgggtcggct 840  
ctgccggtgc cgggtgctga ccgggtgcgg gcggcggttcg gctgcgaggt gtacgagggg 900  
tacgggctca ccgagacctc gccctgcgtg gcgtacaacc agccgggcat cccctgcaag 960  
ccgggcacgg tggggctgcc catcgacggc gtacgggtcg ccatcgccga cgcgagctg 1020  
gaaggacgca tcaggctgct gaagcagggc gacatcggcg agatcgtcgt gagcggacac 1080  
aacgtgatgg cgggctacct cggccggccg caggagaccg ccgaggtact ggctgcacggc 1140  
tggttccgga ccggggacat gggcgtgcag gacgaggacg gctatctgtc catcgtcgac 1200  
cggaagaagg acatgatcgt ccgcggtggc tacaacgtct acccccgcga ggtggaggac 1260  
gtactgctgc gccatccgc cgtggacggc gcctgcgtgg tcggcgtgcc gagcgtgaag 1320  
cacggcgagg aggtgtgcgc cgtggtccgg gtgaagcccg gtcagcgcgc gagcggcttc 1380  
ctcgcggagg agatcgtggc ctggagccgg gtgcacatgg cggcctacaa gtaccgcgc 1440  
cgctcgcagt tcgtggagac cttcccgtg ggatcgagcg gcaaggctct caagcgggag 1500  
ctggcacacc gctacgcgtg a 1521

<210> 75  
<211> 217  
<212> PRT  
<213> Streptomyces aizunensis

<400> 75

Val Pro Thr Arg Thr Val Glu Glu Asp Ile Glu Ile Val Leu Ile Val  
 1 5 10 15  
 Arg Asp Asp Met Arg Arg Tyr Gly Val Glu Gly Met Cys Arg Ser Leu  
 20 25 30  
 Asp Thr Pro Val Glu Ala Gln Ser Tyr Ala Asp Phe Asp Asp Leu Asp  
 35 40 45  
 Pro Phe Ser Gly Gly Gln Leu Val Ile Leu Ser Ser Asp Ala Ala Gly  
 50 55 60  
 Pro Leu Ser Ala Glu Thr Ala Glu Ser Leu Arg Thr His Glu Ile Pro  
 65 70 75 80  
 Val Leu Ile Leu Val Asp Ser Ala Ala Pro Val Glu Gln Ser Trp Ala  
 85 90 95  
 Asp Gln Ala Arg Gly Phe Leu Asp Trp Ala Asp Leu Arg Pro Asp Thr  
 100 105 110  
 Leu Arg Asp Ala Ile Ala Asp Val Ala Ala Gly Arg Phe Phe Ala Ser  
 115 120 125  
 Glu Thr Leu Ala Arg Arg Ser Val Thr Ala Ala Glu Gln Thr Glu Gly  
 130 135 140  
 Gly Thr Pro Ala Ala Arg Ser Pro Ile Thr Leu Thr Ala Arg Glu Leu  
 145 150 155 160  
 Gln Val Leu Arg Leu Ile Ala Gly Gly Leu Ser Asn Arg Gln Ile Ala  
 165 170 175  
 Arg Ser Leu Asn Ile Ser Glu His Gly Val Lys Arg Leu Val Gly Ile  
 180 185 190  
 Val Leu Ala Lys Leu Asn Cys Pro Asn Arg Thr Leu Ala Val Val Arg  
 195 200 205  
 Ala Ile Asp Ala Gly Leu Leu Thr Leu  
 210 215

<210> 76

<211> 654

<212> DNA

<213> Streptomyces aizunensis

<400> 76

gtgccgaccc gcactgttga ggaagacatc gagatagtcc tgatcgtccg cgacgacatg 60  
 cggcgctatg gcgtcgaggg aatgtgccgt tgcgtggaca cccccgtcga ggcgcagtcc 120  
 tacgcggatt tcgatgatct cgacccttc tccggaggcc agttggtcat cctctccagt 180  
 gatgcggcgg gtccctctc cgccgagacc gccgaaagcc tgcggacgca tgagataccc 240  
 gtgctgatcc tggtcgactc ggccgccccg gtcgagcagt cctgggccga ccaggcgcg 300  
 ggcttcctgg actgggcgga tctgcgcccc gacaccttgc gcgacgcgat cgccgatgtg 360

gcggccgggc gcttcttcgc gtcggagacc ttggcgcggc gctccgtgac ggcggcggag 420  
cagacggagg gcggaacgcc cgcggcgcgg agcccgatca cgctgacggc gcgtgaactc 480  
caggctctgc gcctgatcgc gggcggctctg agcaatcggc agatcgcgcg gtcgctgaac 540  
atctccgagc acggtgtcaa acgcttggtc gggatcgtcc tggccaagct caactgtccg 600  
aaccgcacgc tcgccgtggt ccgtgccatt gacgcgggtc tcctcacctt gtga 654

<210> 77  
<211> 442  
<212> PRT  
<213> Streptomyces aizunensis

<400> 77

Met	Thr	Lys	Asn	Gln	Glu	Pro	Arg	Asp	Pro	Ser	Gly	Thr	Arg	Pro	Arg	1	5	10	15
Lys	Ala	Ala	Ala	Ser	Gly	Lys	Pro	Ser	Leu	His	His	Ala	Val	Pro	Pro	20	25	30	
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Cys	Pro	Asp	Ala	Arg	Cys	Cys	Pro	Ala	Glu	Gly	Thr	Ala	Leu	Thr	Val	180	185	190	
Pro	Gly	Thr	Ser	Val	Met	Ala	Ala	Ala	Ala	Thr	Tyr	Ala	Gly	Leu	Arg	195	200	205	
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